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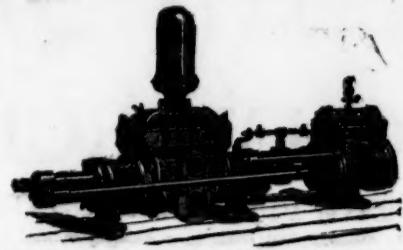
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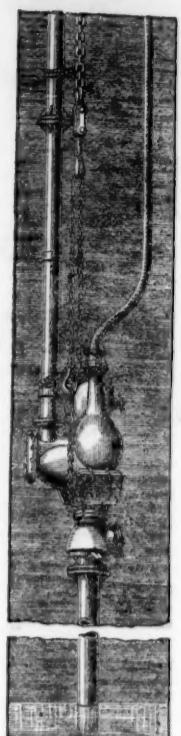
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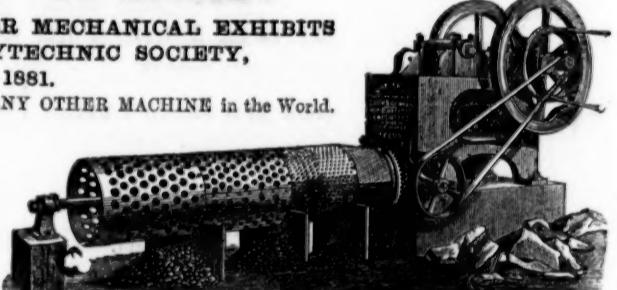
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DEAR SIR.—I am pleased to be able to tell you that the Machine works splendidly. We are breaking 16 trucks a day now, and we thought it a good day's work to do 10 a day with the old Machine, so you can see the difference. I had a gentleman looking at it yesterday, and he was surprised to see it work so easily.

Yours truly, E. ORGAN.

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8TH OF SEPTEMBER, 1882.

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THE EXPLOSIVES COMPANY (LIMITED),
30 AND 31, ST. SWITHIN'S LANE, LONDON, E.C.

Meetings of Public Companies.

NACUPAI GOLD MINING COMPANY.

The first ordinary general meeting of shareholders was held at the offices of the company, Queen-street-place, on Tuesday, Mr. E. A. MAYGORODATO in the chair.

Mr. JOHN GARLAND (the secretary) read the notice convening the meeting.

The CHAIRMAN said:—The present meeting is held in pursuance of the provisions of the Companies Acts, which require that a statement should be made at the first opportunity to the shareholders as to the constitution of the company. With us it is a mere matter of form, as the company has issued none of the shares to the public; but the original proprietors of the Nacupai properties formed the new company, and transferred the properties to it in the form of a sale, but virtually receiving nothing from it but its shares in payment; the small amount of cash payment being merely the adjustment of cash items—the cash items transferred to the new company are equivalent to the cash balance claimed. The capital, as you are aware, consists of 600,000^l, of which 100,000^l are 8 per cent. preference shares, 500,000^l ordinary shares, and 30,000^l founders' shares. Of this capital there have been issued to the vendors 70,000^l preference shares, 290,000^l ordinary shares, and 20,000^l founders' shares, and to the Nouveau Monde Company, in virtue of their participation to one-third of the profits, as an equivalent to their cash contribution to the purchase of the mines, there have been issued 150,000^l ordinary shares and 10,000^l founders' shares. The balance of 60,000^l ordinary shares, and 30,000^l preference shares are reserved by the company for future issue. The properties, as you are aware, consist of 10 concessions situated in the well-known auriferous district of Nueva Provincia, in Venezuela. They were originally conceded to Mr. Austin, United States Consul at the time. One of the concessions—the No. 1—has been worked by our predecessors, the Orinoco Company, and they extracted from it 100,000 ozs. of free gold. This company had extensive undertakings in hand which do not appear to have answered so well as this, and it had gone into liquidation. Our vendors bought the Nacupai property from their assignees through the court, and received regular titles, which are now in course of transfer to the new company by registration in Venezuela. Of the 10 concessions, only one is at present at work. The present shaft is 220 ft. deep, with galleries of 200 ft. east and west. The mine is fully equipped with storehouses, valuable machinery, steam-power, and a mill of 50 stamps, also a good dwelling-house. The River Yururi traverses our property, a most valuable appendage in a country where the want of water causes vast inconvenience and expense to other mining enterprises not so fortunately circumstanced in regard to this important element. You can understand, gentlemen, that in a country so distant, and where trans-port is so difficult and expensive, what an immense advantage it is to have acquired this mine fully equipped with machinery, which would have cost us 100,000^l to erect. It is scarcely necessary to inform you of the good opinion entertained about the richness of the mine which we are working, for this opinion is universal. When the vendors took possession they had to take the water out, and the examination made since on the spot confirmed in every respect the favourable opinion originally formed, not only by our own officers, but such independent judges as the chief manager and the mining captain of the Callao Company. The opinion expressed by these two latter gentlemen, Mr. Oxland and Mr. Ponberthy, is that the Nacupai will prove only second to the Callao, to which it is conterminous. What we have to do is to deepen the shaft and develop the galleries so as to get sufficient ore for our mill, whose capacity is from 300 to 350 tons per week. The ore at present level is expected to give from 2 to 2½ ozs. of gold per ton. But, as is well known, the Callao is getting much richer ores at greater depths. Taking the ore at 2 ozs., and an output as above estimated, we shall have from the present shaft over 15,000 tons of ore and 35,000 ozs. of gold per annum. I said that our properties consist of 10 concessions, and I have to state that all the other nine concessions are equally favourably reported upon, and we shall have to deal with them later on as circumstances will dictate. Of these concessions there is one known as No. 9, the richness of which has been indirectly proved by results. On this matter I have to make a statement to the meeting, which I do with great regret, as what I am going to state affects deeply the conduct of a sister English mining company—the Chile Company. The manager of the mines of this company in Venezuela, Mr. Nicholson, which mines are contiguous with our No. 9 concession, attacked, no doubt, by its extreme richness, has invaded this property of ours in a most improper and unjustifiable manner by working their tunnels underground into our property and extracting the ore therefrom. The Chile Company are producing at the rate of 3000 ozs. of gold per month. Their actual production for the first nine months of this year is over 25,000 ozs. of gold, and it is the universal opinion in the district that they are getting the bulk of this gold out of our said property, and we ourselves have no doubt whatever about it. In fact, I could refer you to their last report, in which they go a great way to admit it, and we have been compelled to commence an action at law against that company to eject them, and recover adequate damages for these illegal proceedings. At their last meeting, held on May 17 last, the Chairman of the Chile Company, Mr. Harvey, mentioned that they had acquired a very valuable property, and congratulated the shareholders upon this fact, but he said not a word that the owners of the property had commenced an action against them for its recovery. Upon this we requested our managers, Messrs. John Taylor and Sons, to write a letter to the papers challenging the statements of Mr. Harvey. I am going to read you this letter which appeared in the *Mining Journal* of May 26 last, and is as follows:—

The attention of the proprietors of the Nacupai Mine has been called to the report in your issue of the 19th inst., of the general meeting of shareholders of the above company, held at the City Terminus Hotel on Thursday last, when Mr. John Harvey, the Chairman, is reported to have made the following remarks:—“During the past year the board in the interest of the company considered it advisable to obtain an adjoining property called ‘Austin No. 9’ that bounds our property to the north, and though possibly not of much value to any other company or owner on account of the absence of water, and the small area, it was of importance to us, as it enabled us to commence the additional shafts necessary for working our property to advantage on the lode instead of sinking shafts through hard and unproductive ground. I hope that the extension of our property will prove remunerative and valuable to this company.” With reference to the alleged purchase of Concession No. 9, we are instructed to inform you that correspondence has recently taken place between us on behalf of the Nacupai properties, and the directors of the Chile Company, by which we informed the directors of the Chile Company that the property was vested in the nominees of the Nacupai proprietors, and stood registered in their names at Bolívar; also, that the title had been approved by the most eminent advocate at Bolívar, and that the deed of the transfer had been duly registered with all the formalities required by Venezuelan law, and we warned the company against allowing their manager, Mr. Nicholson, to negotiate for the purchase of the said concession. We submit that, after the warning that the Chile directors received from us, and, in the face of the legal proceedings now pending, they ought not to have put the matter as they did at the meeting without even alluding to the correspondence above referred to.—JOHN TAYLOR AND SONS.

You will be surprised or rather not surprised, that the directors of the Chile Company did not venture to meet the charge made against them; they have not even vouchsafed any reply to it. Our case is not a singular one, however, for another English company in Venezuela, the Potosí, have begun an action against the same Chile Company, for invading their property, and we understand that the Potosí Company have just received intelligence to the effect that the suit has been settled in their favour. Such infractions of other people's rights have formed the subject of severe comment in the district, where it was unheard-of of thing previous to these occurrences to hear of any infraction of neighbours' rights even by the natives themselves, and the example given to them by an English company is most pernicious. Fortunately the conduct of the Government has been irreproachable, and all that good faith in the performance of their contracts would dictate. They feel that the prosperity of the mining industry depends upon such a liberal policy, and avoid harrassing the enterprises, which at great labour and risk are attempting to develop the vast mining resources of this exceptionally rich gold district. To return to our case against the Chile Company, and to give you some idea of the opinion formed by the legal courts, their manager, Mr. Nicholson, has been prohibited from leaving the country, pending the trial of the action, and bail has been refused by the court. I hold in my hand the translation of a decree issued by the Finance Minister declaring null and void the concession to the Guyana Company of the so-called lapsed mines, upon which Mr. Nicholson pretended to base his unwarrentable proceedings. The decree is as follows:—

United States of Venezuela, Ministry of Finance, Direction of Territorial Wealth, Caracas, June 30, 1883, year 20 of the Constitution, and 25th of the Federation:—However general the terms of a contract may be, the concession of mines in action, in virtue of anterior Acts, do not accrue to that contract in case they are formally declared forfeited. They then revert in their previous condition of free territories, and Government enters in possession. Considering further, that in the contract effected by the Federal Executive with General V. Pulgar on May 12, 1881, and approved by the Congress on the 24th of same month and year, the period expired within which the mines conceded by it were to be put in exploitation, as likewise the prorogation which was granted to him at his demand to that effect, in conformity with the same contract. The executive is not authorised not even to consider, much less to approve, the agreement which Mr. Albert A. Nicholson in the name of the Guyana Company has presented to the Ministry in a printed form, dated Cíudad Bolívar, May 31, just passed. Let it be communicated and published.—For the Federal Executive, M. CARABANO.

Mr. Nicholson evidently anticipated that he could not support his right on the Guyana concession, and to add to his *mala fides*, he created another pretension, which consisted of a sham purchase of the No. 9 concession at a nominal price from a Mr. Snell, who had already been declared by the courts to have no rights or ownership in the said property. We must take this opportunity of expressing our surprise that the gentlemen composing the board of the Chile Company (who hold responsible positions in the City of London) should not long since have repudiated the unwarrantable act of their agent, and that they should have, in fact, sanctioned by their silence this attempt to acquire property belonging to other people, and conveyed to them by formal acts and deeds, which have been confirmed and approved by the courts in Venezuela. Now, gentlemen, the fact that a large amount of gold is taken from our concession No. 9 is a proof that the concession is extremely valuable, and it is our intention to prosecute the action already commenced against the invader of our rights, and, in fact, to support the decree already pronounced by the Venezuela's courts. I hope at our next meeting to report to you favourable results, both as to this matter, and as to the general enterprise in which we have embarked. That, gentlemen, is the statement I have to lay before you. The company may be said to have been scarcely formed, therefore no accounts could be presented, and no results of working could be put before you at the present moment, as the company has only just commenced to work the property we have in hand. I think I have given you sufficient information. We have the full equipment for the projected works; we have the shaft already completed to a considerable depth, and the galleries as well, and what is to be done is to push on the works and try to extract the quantity of ore requisite to enable us to present results such as we anticipated. If any gentleman has any questions to ask I shall be

happy to answer them. I will now propose that this statement be adopted, and that will be the whole business to be transacted.

The resolution was then put and carried. A vote of thanks to the Chairman closed the proceedings.

QUARTZ HILL CONSOLIDATED GOLD MINING COMPANY.

In pursuance of section 139 of the Companies Act, 1862, a general meeting of shareholders was held at the offices, Gresham House, Old Broad-street, on Tuesday, “for the purpose of receiving the report of the liquidators showing the manner in which the winding-up of the company has been conducted during the preceding year, and also for the purpose of accepting the resignation of Mr. F. F. Powell, one of the liquidators of the company, and of considering, and if deemed advisable, of appointing a liquidator in his place to continue the voluntary winding-up of the company jointly with Mr. C. H. Dunhill, or of authorising Mr. C. H. Dunhill to conduct the liquidation alone as sole liquidator.”

Mr. C. H. DUNHILL, one of the liquidators, occupied the chair.

Mr. TRURAN read the notice calling the meeting.

The CHAIRMAN said that this was purely a formal meeting to satisfy Mr. Beall, and to prevent annoyance. It was the intention of the directors not to have held the meeting until something more definite was settled with regard to the lawsuits now pending, and which now that the law courts were open, was expected to be settled very shortly. The liquidators during the past year had done their best to put an end to the lawsuits left from the old company, and they had paid off the debenture debt of 3000^l, by money received from the Denver Company for the purpose. The solicitor, Mr. Snell, was present, who would inform them of the present position of the lawsuits. There was no resolution to be placed before the meeting except that Mr. Powell, owing to the state of his health, had been ordered to New Zealand, and had, therefore, been compelled to resign his position as one of the liquidators. Mr. Powell had worked hard for the company, and the shareholders were greatly indebted to him for his exertion. He should be happy to answer any questions relating to the liquidation, and he hoped before long to call them together to finally close the Quartz Hill Company.

Mr. SNELL said the meeting would not have been held had not Mr. Beall seemed inclined to make a fuss about the matter. It was necessary that a meeting should be held within 12 months of the company going into liquidation or as soon after as was convenient, and Mr. Beall applied to know why it was not held, and, therefore, the liquidators thought it better to hold it, although all they had to say was that the assets had been transferred to the Denver Company, who had undertaken all the liabilities of the Quartz Hill Company. Mr. Beall had an action to recover sums to the amount of 150^l, and the action was not only against the company, but also against four or five promoters. The cost of that action had it gone to a trial would be between 1000^l and 1500^l. That case was undertaken by Mr. Beall on the statement that the parties joined in that should be liable only to a subscription of 2s. per share. That action was carried on by Mr. Beall, but he believed it had been stated by some of the plaintiffs that they did not know what they were entitling upon, and in fact an application had been made by one of the parties for a return of the papers on the payment of 12s., and an order had been made that this should be done, and Mr. Beall had to pay the costs. Had it not been for that the liquidation would have been closed.

A SHAREHOLDER asked whether there were any accounts?—Mr. SNELL said the whole had been handed over to the Denver Company, and the accounts would be presented by that company. Every shareholder in the old company was entitled to a proportion of shares in the new company.

Mr. F. W. WILSON said he was sure they all deeply regretted the resignation of Mr. Powell, and the course which led to that resignation, and he was sure the shareholders would all join in the hope that Mr. Powell would return from New Zealand fully restored in health. He thought there was no occasion to appoint another liquidator, as the liquidation could be concluded under the able supervision of Dr. Dunhill, who had laboured hard to bring the affair to a successful issue. He moved that the resignation of Mr. Powell be accepted, that a vote of thanks be passed to him for his services, and that no other liquidator be appointed, but that Dr. Dunhill be requested to finish the liquidation.—Mr. DAWSON seconded the motion, which was carried.

A vote of thanks to the Chairman closed the proceedings.

UNITED MEXICAN MINING COMPANY.

The ordinary half-yearly general meeting of shareholders was held at the offices of the company, Great Winchester-street, on Wednesday,

Mr. G. HARRIS in the chair.

In the absence, through indisposition, of Mr. W. M. Browne, the secretary, the notice calling the meeting was read by Mr. J. R. PAVEY, the acting secretary.

The directors report that the mine of San Cayetano de la Ovejeria had now become a profitable undertaking, and they give a tabular form showing the results of the mine for the four quarters ended July 28. There has been an excess of returns over outlay for the year ended that date of \$95,044. The owners of the mines of Rayas and Jesus María have continued to work these mines, but without profitable results, consequently the company have not received any receipts in liquidation of the respective debts due therefrom. The accounts of the haciendas of Duran for the half-year show a loss of \$2894, in reference to which Mr. Hay reports that in July and August he raised the charge for reduction as well as augmented the grinding power from 24 to 28 arrastres, thereby feeling confident that when the accounts are made up at the end of the year, a better result would show itself.

The directors have sent a further supply of rails and other appurtenances, which have been shipped to Vera Cruz on account of the mine, and hoisting crabs and other gear are ordered, and will go forward in a very short time. These appliances will be the means of greatly facilitating the extraction of ore, and also considerably diminish the expenditure. They cannot conclude without stating that the favourable opinions expressed by them in the previous reports issued to the proprietors, “that ultimate success would result by steadily persevering in the explorations in this extensive mining property,” appear to be realised, and they confidently look forward to much more favourable returns being attained. There is also a possibility, that as the adit of San Cayetano may be considered from the recent discoveries to be the key to the whole of the La Loma lode, the undertaking may yet become one of the greatest mining properties in the Republic of Mexico.

FINANCE.—On Oct. 1, the date of the last letter from the commissioner, his available funds at Guanaxuato amounted to \$6579, without any liabilities, and the estimated value of ore under reduction to \$78,150, and his advice that he intends sending to the board by next French packet a remittance of six bars of silver. His dispatch also states that the improvement in the mine continues.

The CHAIRMAN, in moving the adoption of the report and accounts, said: Gentlemen, the directors have great pleasure in meeting you here to-day, inasmuch as the hopes which we have so constantly expressed from this chair that this company would ultimately be a success, are now realised, and we have, we think, a very splendid property—second to none in Mexico. (Cheers.) The gigantic work in the adit, which has been so many years in progress, has now led us, I may say, into great wealth, because we are continually improving the production from the mine; and now that we have provided Mr. Hay with all the rails and other appliances which he required to tram out the ore, we are looking to very much greater results. Since we last had the pleasure of meeting you the output of the mine has very sensibly increased. If you will kindly refer to the figures on the other side of the report you will see how progressive the mine has been. We have thought it better to give you the four progressions ended in July last, simply because you will then be able to see how progressive it has been. You will see that the excess of returns in October, 1882, was simply \$4709; in January, 1883, \$14,082; in April, 1883, \$28,052; and in July, 1883, it was \$45,200. We are now working to even a greater extent without the appliances which we sent out. We have not yet got advices that the whole of the rails have been laid, but they will be very shortly, as they all have been sent off. There are some few other things to send, and they will be shipped very soon. We have received advices that at last they have begun to remit to this country. We have now on the way six bars of silver, consigned to the Bank of England, of the value, as we make it, of about 1700^l. This is small and the first consignment, but the directors hope and believe it will continue and increase. The report goes so fully into details that I need not dwell on it at any length. We have a sketch map here made up to a certain date, and containing some additions to the map last issued. I now beg to move the adoption of the report and accounts, and if any gentleman has any questions to ask I shall be happy to answer them, and give every information in my power. Perhaps some gentleman in the room will second that, and then we can proceed with the discussion.

—Mr. GOLDSMITH seconded the motion.

Mr. RUNGE said the present report did not contain any Mexican balance-sheet, and, therefore, he had to refer to the last balance-sheet for the point he wished to elucidate. There was always in the balance-sheet a large amount expended besides the capital which had been invested in the mine; heasked for an explanation of that?—The CHAIRMAN: Not a very large amount—only \$596.

Mr. RUNGE: On the new concern altogether \$348,000, and \$23,000 last year, \$371,000 altogether. Has that amount to be made up out of the profit of the new concern before there is any dividend?

The CHAIRMAN: You will see there is an item of \$95,000 with a star against it in the Mexican account in the new concern. This is the profit of the mine of San Cayetano for the four quarters ending July 28 last. It is disposed of as follows:—We have spent upon five different mines just sufficient to keep up our rights, amounting to over \$5000. We have also disposed of other money in this way:—There is the amount of \$5000 odd paid to owners without aro (contract)—the shareholders who did not come into the arrangement, but who held aloof, and we were obliged to give them so much money, and we have given them under contract. Then we were obliged to form a suspense account to take half the profit of the mine until it amounted to \$160,000. When the \$160,000 was being placed to reserve we and the owners divide according to our proportions—three-fourths for the company and one-fourth for the owners. The amount apportioned to reserve is \$42,000, and the amount paid to owners with aro, who are partners with us is \$5000, leaving a balance for the mine of \$36,000.

Mr. RUNGE: Will the company be at liberty to distribute the \$36,000 as dividend, or is there any claim?—The CHAIRMAN said the only claim was to the

amount apportioned to reserve, and that was to be paid out of the suspense account.

The CHAIRMAN said the succeeding two months had produced about \$34,000.

They were restricted in the output till the tram was fixed. Of course, that \$34,000 was in ore, but it could be sold at any moment, and, in fact, in another week the directors expected to receive information of a public sale of ore. The shareholders had already waited so long that the directors even at a slight

sacrifice thought it better to sell the ore in public market and remit the proceeds to this country.

The SHAREHOLDER said the directors had also waited a long time, and had done a good deal of work without remuneration.

A SHAREHOLDER asked whether the accounts could not be made out in English money instead of Mexican dollars?

The CHAIRMAN said that the dollar fluctuated, and the present system was considered best. The dollar was taken at 4s. He should like to read a letter which the directors had received a few days since from Hamburg, from a gentleman named Oetling, who had been many years connected with the mine, and which contained news three weeks later than had been received by the directors. The letter was as follows:—“I beg leave to inform you that on Oct 27 I received a telegram from a correspondent at Guanaxuato as to the mines; and, as regards the mine of San Cayetano, that a decided improvement had taken place, which, no doubt, will be of interest to the directors to communicate to the shareholders at the ordinary half-yearly meeting, which is to be held on the 7th inst.” That was very important, as it showed that an improvement had taken place three weeks later than the date of the directors' letters.

Mr. ROBERTS asked whether the directors could not arrange to have telegrams sent home giving the latest information?—The CHAIRMAN said the directors had never considered it necessary, but, of course, if any very important discovery were made, and Mr. Hays sent a special message, it would be communicated to the shareholders.

A SHAREHOLDER asked whether the 1767 unexchanged shares belonged to the company?—The CHAIRMAN: No, to the original proprietors, who did not come into the reconstitution of the company in 1862, when it merged into a limited company. I do not think any claim will be made, but we are bound to exchange them at any time if they pay the calls. We cannot forfeit them. It is a positive debt in perpetuity. (He the Chairman) in answer to a further question said that there was not now any consulting engineer in England; but in Mr. Rocha, who was now at the mine, they had one of the most able engineers in Mexico, who possessed the full confidence of Mr. Furber, the former consulting engineer, and recently one of the directors.

The resolution for the adoption of the report and accounts was then put and carried.

On the motion of Mr. GOLDSMITH, seconded by Mr. RUNGE, a

glad to receive instructions to commence the work at once. As regards the Western vein he certainly should very much like to see it properly tried by the completion of the tunnel, the distance driven so far being only 18 yards out of 120 yards, the width of the vein at the adjoining quarry.

A SHAREHOLDER seconded the adoption of the accounts, which having been put to the meeting was carried unanimously.

The CHAIRMAN said it was clearly desirable that the work proposed by Mr. Kellow on the eastern side of the shaft should be carried out, the expense being but small, and he and the other directors were willing to find their quota towards the cost provided the other shareholders also came forward. Should they not do so it would, he thought be desirable to offer a lease of the quarry by tender at a premium. Although a debenture and share holder he would prefer that those who had for so long been interested in the property should reap the success, if there were any.

The retiring directors, Messrs. Lambert and Maw, were then re-elected, also Mr. E. Brooks, the auditor. A vote of thanks to the Chairman terminated the proceedings.

WHEAL BASSET.—At the meeting on Thursday the accounts showed a loss on the six months' working of £2547, and a total debit balance of £8657. A call of 8s. per share was made, payable in two instalments. There were 97 tons of tin sold, the average price made being 55s. per ton. The Chairman intimated that the report was the best ever presented, and it was hoped that in the next half-year they would make both ends meet.

WEST FRANCES.—At the meeting on Thursday (Mr. Walter Pike in the chair) the accounts showed a loss on the 16 weeks' working of £2751, and a total debit balance of £4647. A call of 2*l.* per share was made. The report of the agents having been submitted, Capt. Thomas said that for some time past they had paid water charges to South Frances and West Bassett, on account of an engine at Wheal Bassett. It was nearly 6*l.* a quarter. He did not think they should continue paying that amount, and he should advise the adventurers to act accordingly. They were certainly drawing as much water from the other mines as other mines were from them, and he thought every mine should take its own waters. The Chairman observed that at the last meeting everyone was dismal; everything seemed lost, and it only appeared a question of working another four months unless something turned up. But something had turned up, and he trusted that the lode would wipe off the debt that was against the mine, and that it was an augury for a bright future for West Frances. He believed that the next 16 weeks would show them very different state of things. An increase in their returns of 10 tons per month would put the balance on the other side.

LEVANT.—At the meeting on Tuesday the accounts showed a loss on the sixteen weeks' working of £2617. The Chairman (Mr. White) observed that at the last account they made a dividend, and some thought they ought not to have done so. But if the money had not been divided then it would have been that day, and he was sorry they did not show a profit. They showed, however, but a small loss, and the bills had been brought up closer. In the Camborne and Redruth district adventurers had been bringing up their liabilities and making calls. He was pleased to say that they had no occasion to make calls in consequence of the mine being thousands of pounds in debt. None of the St. Just mines were in that position. They had charged up everything as closely as was possible. Next month they would have a sale of arsenic, and he hoped the mine would improve, and that they would return to dividends.

Glasgow CARADON.—At the meeting on Monday the resolutions passed on Oct. 19 were confirmed—first "that the capital of the company shall be increased to the extent of 4000*l.*, divided into 4000 shares of 1*l.* each, which the directors are hereby authorized to issue as and when they think proper; that said shares shall be preference shares, and shall form a preferable charge, both as regards capital and dividend, on the funds and assets of the company to the ordinary shares of the company; that the dividends on said preference shares shall be cumulative, and shall be at the rate of 7 per cent. per annum on the paid-up amount of said shares; and that the said preference shares shall, in the opinion of the directors, be redeemable at par, with a bonus of 5 per cent., within five years from date of issue;" and secondly "that, with reference to the special resolution passed on Feb. 6, and confirmed on Feb. 21, 1865, the directors shall, in relation to the new shares thereby created, in so far as not already disposed of, have power to dispose of the same in such manner as they think most beneficial to the company."

GUNNISLAKE (CLITTERS).—At the meeting on Monday (Mr. J. E. Isaacs in the chair) the Chairman stated that their labour costs, ad been reduced by about 500*l.*, principally due to a less number of men being employed underground during the past four months than for the 12 months previously. He was pleased to announce that they had made a profit on the four months' working of 379*l.* 15*s.* 7*d.*, which wiped off the balance against them at the commencement of the account, and left them with 108*l.* 15*s.* 11*d.* in hand. Mr. Horwill, the auditor, certified that he had examined all the transfers and share register and ledger, and that the whole were correct, while the list produced represented 9332 shares, with 41*s.* as forfeited, making in all 10,240 shares. The report of the agents, Capt. J. C. Scobcombe and O. W. Beccombe stated: On Crease's south lode since last meeting we have been driving east on top of rive on course of lode, and intersected the cross-course, and have driven north and intersected the lode on the eastern side at which point we find the lode to be about 10 in. wide, composed of spar, iron, sulphur muriate, and little copper ore, but not to value. We are of the opinion that we shall have something good in going east as we get away from the influence of the cross-course. We advise this end to be pushed on some distance, and at some future time drive a cross-cut north to intersect Crease's north lode, which is 15 fms. above the adit level, seeing these lodes are only about 14 fms. apart from each other. On the motion of Captain Skewis, seconded by Mr. W. Mathews, the report was adopted.—The Chairman remarked that they were in possession of all the necessary appliances to drive the 123 west with boring machinery, but four men more would be required for that part of the mine. The agents also recommended that a larger number of miners should be employed in other levels. In this view the committee concurred. It was eminently satisfactory to hear such a promising report read from the agents.

TREGEMBO.—At the meeting on Wednesday (Mr. Rawlings in the chair) the accounts showed a debit balance of £1477. No call was made. Capt. Chegwin, in concluding a satisfactory report, said that should the lode in the 30 prove of equal value to the 16 they would then have a reservoir of tin ground which, with three times their present stamping power, would take many years to return. With reference to the pneumatic stamps, he said that he hoped he could get the returns of the stamps every four weeks up to 600 tons with the two hands.—Mr. G. Carter wished to know what were the costs during the past month, but it was urged by Mr. Gould that as the costs were only charged to the end of August the question ought not to be asked. It was, however, afterwards admitted that loss was at the rate of 20*l.* per month.—Mr. Gould remarked that the stamps had been working five months. They had sold 20 tons of tin; they had 6 or 8 tons of tin in the hutes, and with what was on the floors there was a total of 50 tons. This was 10 tons a month; and putting this by the side of the legitimate expenses of the mine, they had more than paid their way. He asked Mr. Husband if the stamps could be worked at the rate of 145 blows a minute?—Mr. Husband said the stamps was an entirely new system of stamps, and was tried there for the first time. When they commenced it was agreed to go on as economically as possible, and they decided upon a 24-in. cylinder-engine, and to erect a pair of heads of these oscillating stamps. It was first arranged to work by day, and afterwards they also worked by night. The engine, however, had also had pumping gear attached, which had interfered with the speed of stamps. They had been running on the average 115 blows per minute since the engine had been at work. The difference between 115 and 125 per minute was 10 tons per 24 hours. He did not recommend to exceed 125, which would stamp 600 tons per month. It would not do to stamp their crystallized tin finer. They had to slice them thinner than in any mine in the country. (Hear, hear.) He had guaranteed that the wear and tear would be 5 per cent. less than the old head. The cost in the ordinary head was 10*s.* per month, and this, for 20 heads, would be 15*s.* per month, or 7*s.* for five months, which period they had been working. Their cost had been but one-fourth the cost of the ordinary head, as theirs for the five months was 1*s.* (Hear, hear.) He explained, in answer to Mr. Gould, that the increase in the speed of the engine gave a harder blow, and this increased the quantity of stuff stamped. It was urged, in a long conversation, that there should be additional stamping power, but it was felt that the time allowed for testing the new stamp should elapse before laying out the floors more extensively.

FAURE ELECTRIC ACCUMULATOR COMPANY.—At the meeting on Tuesday (Mr. E. H. Cadot, a director, in the chair) reference was made to a circular issued by the directors the same morning, which explained the reason for the absence of M. Philippart. At a board meeting in Paris, held as late as 12 o'clock last Saturday night, it had been decided to put before the shareholders the circular referred to, going as little as possible into details; and it was, he said, very important that they should not go into too much detail at that meeting, as they were in the midst of the issue of the shares of the French Metropolitan General Electric Company (Limited). This issue was before the French public that day, and, expressing his own opinion, he said he had the greatest hope and faith that it would be successful. Some time ago he appeared before them, when he spoke in a somewhat similar manner, and it was true that on that occasion he thought they had finally settled the question of the issue of the shares referred to. In that he had been mistaken, but now the prospectus was actually before the public. If, as he had no doubt, the issue was successful this company would be greatly benefited, holding as it did three-fourths of the capital of the French Electrical Company. He should ask them to pass a resolution adjourning the meeting to Dec. 6, when the accounts, which had been left in abeyance, would be submitted to them for approval. Mr. Harcourt Turner protested against the continued adjournment of the meeting, and expressed an opinion that the directors were doing all they could "to shirk submitting the accounts." Mr. Montague Turner having endorsed these observations, the Chairman repudiated the statement that the directors were averse to submitting the accounts. They were not yet, however, in a position to do so, and, therefore, the adjournment of the meeting was asked for. The solicitor (Mr. Campbell) stated that unless the French company succeeded, the Faure Company, as had been previously explained, would have no future, but it appeared to him that the French company were making every effort to place themselves in funds, in order to succeed on the Continent in the great work they had undertaken. He had himself recently seen in Paris the successful manner in which the accumulators had been applied for traction power in the working of an omnibus. Having satisfied the French authorities as to these experiments Mr. Philippart had entered into certain very important contracts, and if they were carried out the French company would be a complete success, in which case this company would reap a very large pro-

portion of the benefits accruing. In answer to Mr. Jones he added that if the French company were not successful the Faure Company would have very little left. It would in fact be very much in the same position as the other electrical companies in London. A resolution was ultimately passed adjourning the meeting for a month.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine shareholder, Redruth (Nov. 8), writes:—Our market has been dull all the week at declining prices. Dolcoath fell 1*s.*, Carn Breas 1*s.*, Tincroft 1*s.*, Cook's Kitchen 1*s.*, West Frances 1*s.*, and West Kitty 1*s.*, but Killifreth advanced 1*s.*. Subjoined are the closing quotations:—Blue Hills, 1*s.* to 1*s.*; Carn Brea, 3 to 3*s.*; Cook's Kitchen, 13 to 14*s.*; Dolcoath, 6*s.* to 6*s.*; East Pool, 39 to 40*s.*; Killifreth, 1*s.* to 1*s.*; New Cook's Kitchen, 13 to 14*s.*; Pedn-an-drea, 9 to 9*s.*; South Crofty, 4 to 4*s.*; South Frances, 8 to 8*s.*; Tincroft, 6 to 6*s.*; West Bassett, 3*s.* to 3*s.*; West Frances, 5 to 5*s.*; West Kitty, 13 to 13*s.*; West Poldice, 5*s.* to 5*s.*; West Seton, 7 to 7*s.*; West Agar, 13 to 13*s.*; Wheal Bassett, 3 to 3*s.*; Wheal Grenville, 5*s.* to 6*s.*; Wheal Pever, 2*s.* to 3*s.*; Wheal Uny, 1*s.* to 1*s.*; West Tolgus, 8 to 8*s.*

Messrs. Abbott and Wickett, stock and share brokers, Redruth (Nov. 8) writes:—We have again to report a dull market in mining shares with the exception of Killifreth, in which a fair business has been done, prices are lower. Closing quotations herewith:—Blue Hills, 1*s.* to 1*s.*; Carn Brea, 3 to 4*s.*; Cook's Kitchen, 13 to 14*s.*; Dolcoath, 6*s.* to 6*s.*; East Pool, 39*s.* to 39*s.*; Killifreth, 1*s.* to 1*s.*; Penhalls, 4*s.* to 4*s.*; New Cook's Kitchen, 3 to 4*s.*; New Kitty, 13*s.* to 13*s.*; South Condurrow, 9 to 9*s.*; South Crofty, 4 to 5*s.*; South Wheal Frances, 7*s.* to 8*s.*; Tincroft, 6 to 6*s.*; West Bassett, 3*s.* to 4*s.*; West Kitty, 13 to 13*s.*; West Poldice, 5*s.* to 5*s.*; West Seton, 7 to 7*s.*; West Agar, 13*s.* to 13*s.*; Wheal Bassett, 3 to 3*s.*; Wheal Grenville, 5*s.* to 6*s.*; Wheal Pever, 2*s.* to 3*s.*; Wheal Uny, 1*s.* to 1*s.*.

—Mr. M. W. Bawden, Liskeard (Nov. 8), writes:—The mining market at the opening of the week assumed a firmer aspect with buyers of several low priced propriections, but on a reaction of the tin standard has again collapsed. Subjoined are the closing quotations:—Bedford United, 1*s.* to 1*s.*; Carn Brea, 3 to 3*s.*; Cook's Kitchen, 14 to 14*s.*; Dolcoath, 6*s.* to 6*s.*; Devon Consols, 2 to 2*s.*; Devon Great United, 4*s.* to 4*s.*; East Caradon, 2*s.* to 2*s.*; East Pool, 38*s.* to 39*s.*; Killifreth, 1*s.* to 1*s.*; Penhalls, 4*s.* to 4*s.*; New Cook's Kitchen, 3 to 4*s.*; New Kitty, 13*s.* to 13*s.*; South Condurrow, 9 to 9*s.*; South Crofty, 4 to 5*s.*; South Wheal Frances, 7*s.* to 8*s.*; Tincroft, 6 to 6*s.*; West Bassett, 3*s.* to 4*s.*; West Kitty, 13 to 13*s.*; West Poldice, 5*s.* to 5*s.*; West Seton, 7 to 7*s.*; West Agar, 13*s.* to 13*s.*; Wheal Bassett, 3 to 3*s.*; Wheal Grenville, 5*s.* to 6*s.*; Wheal Pever, 2*s.* to 3*s.*; Wheal Uny, 1*s.* to 1*s.*.

—Mr. John Carter, mine shareholder, Camborne (Nov. 8), writes:—The share market is very quiet and very little business is proceeding. Prices are rather lower generally. Killifreth has improved to 3*s.*. Subjoined are the closing quotations:—Carn Brea, 3*s.* to 3*s.*; Cook's Kitchen, 14 to 14*s.*; Dolcoath, 6*s.* to 6*s.*; East Pool, 39*s.* to 40*s.*; Killifreth, 3*s.* to 3*s.*; Mellanear, 3 to 3*s.*; New Cook's Kitchen, 3 to 4*s.*; New Kitty, 13*s.* to 13*s.*; South Condurrow, 9 to 9*s.*; South Crofty, 4 to 4*s.*; South Frances, 7*s.* to 8*s.*; Tincroft, 6 to 6*s.*; West Bassett, 3*s.* to 4*s.*; West Poldice, 5*s.* to 5*s.*; West Seton, 7 to 7*s.*; West Agar, 13*s.* to 13*s.*; Wheal Bassett, 3 to 3*s.*; Wheal Grenville, 5*s.* to 6*s.*; Wheal Pever, 2*s.* to 3*s.*; Wheal Uny, 1*s.* to 1*s.*; West Frances, 5*s.* to 5*s.*; West Seton, 7 to 7*s.*

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from the party of tributaries working at 140 ft. level as yet; I expect to clean up for them on Wednesday if all goes well; they have 40 tons of ore for the month, and very good stone. We shall also clean up from the party working at 130 ft. level this week; this party will have over 20 tons; stone very small, and ground very hard, it ought to go 1/2 oz. per ton to pay them wages for the time they have been getting this crushing. We shall commence to crush this week from the party working north of prospecting shaft at 70 ft. level; they will have about 60 tons by the time we catch on them, so with the tributaries and crushing for the public we shall be able to keep the battery going 10 hours per day. We crushed 28 tons from the party working at the 350 ft. level for a yield of 1 oz. 18 dwt. retorted gold; this was for five weeks' work; it gave them very little money for their labour, so they have left the mine. We have crushed 28 tons for a private party this month at 5s. per ton, 9 tons from another party, also 30 tons from the same party, but have not received the money for the last 30 tons as yet, and have commenced to crush from them again; they will be able to keep one battery going all this week if the stone proves to be payable; 22 tons of stone have passed through the battery this month, which will bring our cost per ton for crushing a little over last month. The accounts for the four weeks ending Sept. 24 last show an excess of 282, 13s. 7d. of expenditure over receipts. This is attributed to the fact that very little of the stone raised during the month has been crushed; and as stated by the captain, none of the stone from the 140 ft. level, which at the last crushing gave an average yield of over 1 oz. to the ton. The next month's accounts are expected to show a very full and profitable crushing.

GOLD COAST.—Louis F. Gowans, Oct. 2. I regret to hear that a few of our shareholders are disposing of their shares in our company at prices far below the value they would put on them if they visited the property. Can you not induce some of them to do so? for they will then be convinced of the value of their property. When they see they possess a mine, developed to such an extent that if I had the crushing power to warrant the mining expense I could at once put 30 men to work on lode that will give 3 ozs. per ton, and all these men could be employed in the stopes, besides the men driving the faces of the levels—miners will understand what I mean. They would also see the amount of ground that has been proved by tunnels, to be equally as rich, though not yet developed by levels and underlay shafts, and also the vast amount of ground that has not yet been touched, though it must by all the laws of Nature contain the same wealth of gold. They would see if they were here to-day that they have a 12-stamper gravitation battery at work crushing 8 tons per 24 hours, and that eight more days work will complete the erection of all the new machinery, the engine of which will drive the Luperco's pulveriser, the six arrastras, and also the gravitation battery, so as to release the smaller engine from its now overburden of work and enable it then to drive the long stopped Elephant stamper. With these additions, providing the pulveriser realises my expectations, our crushing power will be 22 tons per 24 hours. They would see that scores of tons of rich blanketing are stored awaiting treatment in the arrastras, and that all the tailings from every pound weight of stone that has been crushed is carefully stacked awaiting concentrating and grinding to unpalatable powder in Wheeler's pans, for I contend that without reducing the Abbontuykoon Lodge to that consistency it is impossible to extract more than 35 per cent. of its assay value. They would see that the difficulties of transports are daily becoming less, that the health of Europeans can stand the climate, and that it is not an impossibility to train the natives into being decent workmen. If they then bear in mind that little more than 23 months ago this mine was unknown, and take into consideration the difficulties we have had to contend with, and yet deem the fact of our already having sent to London 200*t*. worth of bars of gold, not a sufficient warrant of Abbontuykoon's speedy future success, then all I can say is, let them sell their shares, and I have no doubt some of my Australian friends will not be slow to profit by their faint-heartedness. Still as the servant of my company I ask the shareholders not to throw away their shares, I can assure them that on no account can the works be stopped, for in any case I can always, now that the new tunnel is complete, extract sufficient gold to pay working expenses, and with the product from the additional machinery we can surely before the year is out pay a dividend or buy more crushing plant. I have to apologise for sending my directors to expect the completion of the erection of the new machinery at an earlier date, the delay has principally been occasioned by the loss of the surf boatload of machinery, which though fortunately not an intrinsically valuable load still was composed of sundry parts of machinery, the loss of which occasioned a complete, though temporary, alteration in my plans.

GUINEA GOLD COAST.—Manager, Sept. 21: The lode in the end going north of John's shaft was never so good as at present. In the box which I forwarded to you by this mail, containing the average sample of ground [3*t* oz. gold, 0*s* oz. silver] passed through during August month, you will find a specimen, which I took a few days ago from the leader in this end [9*t* oz. gold, 1*s* 2*d* oz. silver]. It should assay several ounces to the ton of quartz, and you must be careful not to mix it with the other sample. The above samples have been received and assayed by Messrs. Johnson, Matthey, and Co., with the result shown between the brackets.

ISABELLE GOLD AND SILVER.—Manager, Oct. 8: As I anticipated, water has driven us from the bottom of the east cross-cut 220 ft. level. There will, of course, be no difficulty when the shaft is down and we can step upwards. We are still getting some good ore above the cross cut which had escaped the notice of the old owners and shall follow it up. I have reduced the force at the mine and mill until arrangements are made to sink the shaft as recommended.

KOHINOOR AND DONALDSON CONSOLIDATED.—Mr. A. Rickard, in his report for the week ending Oct. 13, says respecting the Donaldson Mine:—The No. 1 level stopes are yielding 1*t* ton of smelting and 1*t* ton of milling ore per square fathom. The No. 2 level stopes are yielding 1*t* ton of smelting and 3 tons of milling ore per square fathom. The stopes are yielding more milling ore than for some time past, and are maintaining their usual output of smelting ore of good grade. A winze is being sunk in the bottom of the No. 2 level at 200 ft. from day; the ore vein is of a very encouraging character. At the Champion Mine the 600 level west is in 69*1/2* ft.; the lode is strong and well defined, carrying mineralised material 3 ft. wide. The ore body is still ahead, but indications are most favourable for an early discovery of good paying ground. The 600 level east is in 16 ft. Work has been resumed at this point, and the lode is 1 ft. wide, of a promising character. The 520 stopes west, on tribute, are yielding 1 ton of smelting and 2 tons of milling ore per fathom; these stopes continue to put out fair grade mineral. The 520 stopes east, on tribute, are yielding 1 ton of smelting and 2 tons of milling ore per square fathom; vein of good grade mineral has been discovered at 100 ft. from shaft. The 440 stopes west, on tribute, are yielding 2 tons of smelting and 1 ton of milling ore per square fathom; the vein is chiefly smelting ore of average grade. The 400 stopes east are making a satisfactory yield of 2 tons of smelting and 2 tons of milling ore per square fathom. Some good surface quartz is being found in the upper part of the 200 west stopes. The machinery for the new mill is arriving, and is being hauled from the railway depot to the mill ground. The returns for the month of September show that 29 tons of smelting ore from the Donaldson were sold at the average rate of 832*7/8* per ton, and that 39 tons of smelting ore from the Champion realised an average of 83*1/2* per ton. The total proceeds for the month amounted to £455*5/8* (97*1/2*). A good quantity of milling ore has been added to the amount already stocked, and all milling ore put out by the tributaries will continue to be added, in order to have a good supply on hand for the new mill.

LA PLATA.—Telegram, Nov. 9: Last week's output 450 tons.

NEW EMMA SILVER.—G. Collins, Oct. 17: Since my letter of 10th inst. east level has been advanced 12 ft., making the distance from the incline shaft 140 ft.; the face of this level continues to improve, seam is defining itself, and becoming more regular, with some very high grade ore intermixed with the vein matter, but as yet in not sufficient quantities to save. I enclose assay certificate of two samples ore taken from this seam, showing No. 1, 15 per cent. lead and 940 ozs. silver; No. 2, 47 per cent. lead and 580 ozs. silver per ton. The cross-cut mentioned in my letter of Oct. 10, has been advanced 15 ft., making the distance from the east level 25 ft. Rock is soft, and indications are favourable for ore.

Oct. 24: Progress since my letter of Oct. 17 is east level extended 15 ft., distance from incline 155 ft., no material change in rock, ore seam continues about the same as per my report of Oct. 17. Cross-cut extended 18 ft., making distance from east level 43 ft., face showing considerable mineral stain. Mr. Palmer is expected home in a few days, when we will have tracing of the lower works made, and forwarded immediately. Machinery working nicely.

PESTARENA UNITED.—W. Roberts, H. P. Clemons, Nov. 1: Pestarena District: The incline shaft on No. 1 lode, sinking below the 130, goes down in a great width of mineralised rock; a spicula appears to be now forming on the footwall, under which the lode shows little low grade pyrites. The tip-plat winze sinking under the 130 is being pushed on with all vigour. The lode in the 120 end south is much pinched, and has a greater underlie to the east, composed in the 110 north. The 90 south is now in sterile schist between two broken walls, and driving is suspended. The lode in the 90 north traversed by string of quartz, but produces no ore to value. The 80 south is yielding 2 tons per fathom, at 5 dwt. per ton; it has a vein of quartz and pyrites against the hanging-wall turning out milling work. The driving of the 80 north has been temporarily suspended; the end at present is in stratified massive schist. The 65 end south is unproductive. The 55 carries a small vein of quartz and pyrites, but driving is now suspended in order to stop behind the end. The 33 north is in stiff schistose rock without ore. At Cavone we have cleared and secured old workings to a point about 350 metres in from the Anza; we are now getting into the old excavations, and are unable to estimate to what extent they reach either in the bottom or roof of the level. At surface the shed for the jigsing machinery is now in course of erection.

H. J. Gifford, Nov. 4: Val Toppa: The end driving south on new lode, slide at No. 1 level is yielding 7 tons of ore at 7 dwt. per ton; the lode has widened and is more compact, showing greater regularity. The slide is now almost in the bottom of the level, but the lode, after undergoing a small displacement, continues under it, and carries some good stones of pyrites. The slide in the back close to end above slide presents a very favourable appearance, being a wide lode, with a good quantity of solid pyrites. The lode seems to turn off in the side, and most likely a flat bed will be formed above; the present yield is 12 tons of ore per fathom at 12 dwt. per ton. The trial stops on quartz at the winze below the level is being worked on a very mixed lode containing a great deal of schist; but intersected with this are several small good veins of ore, worth 5 tons per fathom, at 8 dwt. per ton. The cross-cut east on north side of cross-course having communicated with the trial stop the men have been put to sink the winze under No. 1 level. A winze is being sunk on a branch east of new lode, with the object of proving the quartz which is being proved above; the lode is rather small, but very regular, and may improve further down; it is now yielding 4 tons per fathom at 6 dwt. per ton. The cross-cut east of south side of cross-course has now cut into a large mass of poor quartz, which, though driven into about 1*m*, has not yet been traversed. The gold returns from the Pestarena United Mines for October were as follows:—Pestarena District, 333 ozs. 13 dwt. 14 grs. from 655 tons of ore; equal to 10 dwt. 3*1/2* gr. per ton. Val Toppa District, 111 ozs. 13 dwt. 6 grs. from 316 tons, equal to 7 dwt. 1*1/2* gr. per ton. Total, 445 ozs. 6 dwt. 20 grs. of gold obtained from 951 tons of ore amalgamated, showing an average yield of 9 dwt. 1*1/2* gr. to the ton.

PINEFRUITITE.—Manager, Nov. 4: Owing to fete only 10 days' work has been done at the mines during the past fortnight; 620 tons of ore-stuff were broken and sent to the dressing floors during that time, and 72*1/2* tons of silver-lead and 14 tons of hand-picked blends have been prepared for market. I value the stopes and various ends as when last reported on. To push on the driving of the levels I have put six men instead of four in each one. The stopes below the No. 1 adit level, north-west of the slide, being lengthened, I have put on

eight extra miners. There are now employed in this part of the e 40 in the back of this level there are 12 men stopping. In the stopes below the south-east of the slide, the lode is improved in value. There are eight men working at this point. There are four men rising on the lode in the back of the level this side of slide. The new dressing-floors are finished, and in a few days when every part has been properly regulated dressing will be in full operation.

RHODES REEF GOLD.—Manager, Oct. 16: We are pushing on Nos. 1, 3, and 4 tunnels, and making good progress; these tunnels will thoroughly test the reef. The quartz that I have been crushing will be finished to-day, when I will clean up the battery. I am not sure that I shall get all the pyrites through the Chilian mill, amalgamator, and settler this week.

RICHMOND CONSOLIDATED.—Telegram, Nov. 6: Week's run (one furnace), \$15,000, from 261 tons of ore; refinery, \$18,000.

S. Longley, Oct. 15: The 100 south drift from station has been run 18 ft. Total 784 ft. in broken limestone. The 100 south-west drift from above has been run 17 ft. Total 106 ft. in limestone. The 1050 west drift from rise from intermediate drift has been run 62 ft. Total 62 ft. in red limestone. The 1050 east drift from rise has been run 10 ft. Total 26 ft. in red limestone. The 1060 north drift from south-east intermediate drift has been extended 18 ft. Total 25 ft. in limestone. Resumed Oct. 8.

RUBY AND DUENDEBERG CONSOLIDATED.—Oct. 14: Dunderberg: The drift from the upraise above the 300 ft. level has been advanced 13 ft. during the week; total 196 ft. from the upraise. No change. Have shipped 11 tons of tribute ore this week; 13 tributaries at work.—Home Ticket: The drift from the bottom of the incline has been advanced 16 ft. in a westerly direction during the week; total 33 ft. from the incline; the end is in favourable looking ground for entry. The stopes in the back of the third level are producing about the usual quantity of fair grade ore. The last lot smelted assayed \$39.52. A winze has been commenced in the orebody at the end of the third level to connect with the drift from the bottom of the incline, where it is expected that this orebody will soon be encountered. Have shipped 90 tons ore this week, and have 20 men at work. Lord Byron: The tunnel has been advanced 20 ft. during the week; total 388 ft.

SENTINEL.—M. Scantlebury, Nov. 1: As the greater part of our miners have left, the consequence is that none of the stopes are set, but the following is the value of the stopes we have been working during the past month. Five stopes in the back of No. 3 level east are producing from 12 to 18 cwt. of lead and blonde ores per cubic metre. Two stopes in the back of New level are producing 14 and 15 cwt. of lead and blonde ores per cubic metre. One stope in the back of St. Amelie is worth 18 cwt. of lead and blonde per cubic metre. For the coming week I have from 35 to 40 men, and according to your instructions shall get to surface and send to the floors the 200 tons of crude ores which now remain in the mine before the bad weather settles in. I may add that during the past month we have raised 600 tons of crude ore producing 45*1/2* per cent. of lead and blonde from the St. Amelie and New levels. We are now beginning to work the 300 ft. level west from the upraise.

WEST AFRICAN GOLD FIELDS.—Two assays recently made by Messrs. Johnson, Matthey and Co. of samples of the washings of alluvium received from Axim were as follows:—From one parcel weighing 11 ozs. there were obtained 17 grs. of gold and 2 grs. of silver, and from another parcel weighing 15 ozs. there were obtained 2 grs. of gold. A subsequent assay made by them of a similar sample of the result of washing with the Tom gave—produce of gold, 33*1/2* tons; first-class ditto 25 tons; second-class ditto 69 tons; third-class ditto 33*1/2* tons; first-class blonde ore produced 234 tons; second-class ditto 149 tons.

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TELEGRAM.—Nov. 6: 77 tons ore shipped and 117 tons smelted, realising net \$1116; 32 tons tribute ore shipped and 21 tons smelted, producing to company, \$192.

SENTINEL.—M. Scantlebury, Nov. 1: As the greater part of our miners have

first sight, such a fall in stocks would seem to justify a stronger market; as a matter of fact, however, we quote almost the lowest price touched of late—\$16, and there is a little disposition in the market to buy for a rise. The position of foreign politics, the heavy failures recently in other markets, and the want of confidence still felt as to the future course of supplies, have all combined to this end; and further, the unsold stock of Chill bars generally believed to have been bought some time back by a syndicate for the rise, acts now as a heavy weight on, instead of support to, the market.

A month ago we wrote that it was generally believed that whatever the future course of tin might be, the excessive scarcity of available spot warrants would possibly cause a very sharp rise, independently of the general position of the article. The event has proved, however, that, small as the quantity of tin in circulation is, it has been sufficient to satisfy the wants of dealers, while, in the face of the continual offering of forward tin, largely on importers' account, prices have steadily receded from 95*1/2* to 91*1/2*. We anticipate during November more than average shipments from both the Straits and Australia, and large supplies during the next few months from both these countries, and, though the consumption may be good, it will have to constantly increase to hold its own against shipments. We have referred above to the general disinclination of outsiders to buy for the rise, and no article feels this want more than tin. Without such support, and with the possibility always before the market that cash in long held may at any moment be realised in despair, the position is gloomy.

"HOW TO INVEST"—EIGHTEENTH EDITION

Capitalists generally will welcome with cordiality the 18th edition of Mr. E. J. Bartlett's invaluable work—"How to Invest," 18th edition. By E. J. BARTLETT, F.R.G.S. London: Author, Great St. Helens)—since it is given to few books to pass through so many editions, whilst the circumstance proves not merely the utility of the work, but the ability with which it has been written. Mr. Bartlett has a terse and pointed style, and he is not destitute of that vein of humour which throws life and spirit even into a work, ordinarily so dull, which treats of the prosaic art of investing money, and, incidentally, of making it. The present edition has been entirely re-written, and Mr. Bartlett's reputation, as an author upon a subject which daily comes home to men who can talk in these hard times of "surplus profits," will be enhanced it.

The work embraces a wide scope of subjects, and, in fact, it would be difficult to name any point cognate to the matter of investments that has not received attention. A vast amount of information is given about public securities at home and abroad, banks, railways, gas and water companies, telegraphs, cables and telephones, tramways, omnibuses, collieries, iron, steel, and electric lighting companies. He is severe on the subject of bubble companies—showing how they originate, and pointing the moral as well as adornment of the tale by affirming that, were the public to adopt the precautions he points out, these concerns would never come to the maturity of the bursting point. He supplies dictionaries of Stock Exchange and mining terms, by the aid of which even the most uninitiated can approach the money article of a newspaper without dread.

The manner in which he has dealt with home and foreign mines is admirable. Three chapters are devoted to this subject—home mines absorbing two of them. Lead mines he does not hesitate to say are in a position which offers to the bold and well-guided investor the almost certain prospect, at a very early date, of reaping a four-fold crop from the seed he may now sow. He shows the average price of pig-lead for the last 34 years has been 20*1/2*. Is. 5*1/2* per ton. The average price during 1880 was 16*1/2*. 17s. 6*d*, and 1881, 14*1/2*. 19s. 3*d*. During 1882-3 it has been about 14*1/2*. 5*s*. Including these bad years we see that the average quotation has been 20*1/2*, leaving a margin of some 6*1/2*. a ton. Upon a rise of anything like this there would be such a revival in lead mines, and such a demand for the shares of those already established, as he believes would astonish all persons acquainted with the facts.

He also speaks hopefully of the position of tin and copper mines, but is half-hearted in his recommendation of foreign mines, laying much stress upon the difficulties that attend their management. His chapter entitled "A Chance for Legitimate Mining" alone is worth the shilling charged for the book, which, it may be remarked, has now extended itself to very nearly 150 pages. The chapter on "Trade Prospects" is also a valuable contribution to the current commercial literature of the day, for it sums up the general position with singular acumen and judgment. In this chapter he observes:—"I may be asked upon what ground I base my statement as to the hopefulness of trade. I do it upon the greatly improved harvest. The farmers this year have had a good time, particularly those who were able to gather in their harvest before the advent of the September rains. An examination of the Trade and Navigation Returns will show that our weak point is our consumption of home goods. This has been due to the inability of the people to buy them, owing to the vast quantities of money which have had for the last four years or more to be sent out of the country to purchase food. To the extent that our harvest may be an improvement upon those years, to that extent will money be retained here, and of course be available for home products, which otherwise would have gone to enrich the foreign corn producer." In these views every political economist will agree; but Mr. Bartlett deserves none the less credit for putting them so clearly forward. Enough has been said to show the intrinsic value of the work and to indicate its utility to the general public.

GAS SHARES.—The principal business in these shares, according to this evening's report of Messrs. W. L. Webb and Co., of the Stock Exchange and Finch-lane, has been:—Baltia (Limited) Ordinary, 23*1/2*; Brentford Consolidated, 19*1/2*; British, 41*1/2* to 42*1/2*; Buenos Ayres New (Limited), 11*1/2* to 13*1/2*; ditto, ditto, 6*1/2* percent. Debentures, 100*1/2* to 100*5/8*; Bombay (Limited), 6*1/2*; Commercial Consolidated, 25*5/8* to 25*1/2*; ditto New Stock, 18*1/2* to 18*3/4*; Continental Union (Limited), Original, 31*1/2* to 31*3/4*; ditto, ditto, 22*1/2</*

WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS,
MINEOWNERS, STOCK AND SHARE DEALERS, &c
1, ST MICHAEL'S ALLEY, CORNHILL, LONDON

There are differences of opinion regarding most things, and in many things where one would imagine scarcely any difference of opinion could exist. In mines, speculative or otherwise, it may be almost said "as many men so many opinions;" and people often get bewildered by them, and sell out shares just at the time they ought to buy. We remember nearly 40 years ago we took up a mine that everybody abused; we bought all the shares we could get for our clients—but many of them were frightened out of their shares by the remarks and volunteered opinions of those who had other things to recommend; so, instead of shares going up, they went down, and calls were frequent, and those who had taken our advice began to abuse us for misleading them. Even practical agents abused the mine when they inspected it, and one plainly told us that he would eat all the copper ever found in it. We believed, however, in the opinion of the resident agent, and stuck to him, and only a very few months after one agent had promised to eat all the copper found a discovery was made; the shares rose from 5*l.* to 30*l.*, and one client alone cleared 10,000*l.* After this the mine paid over 50,000*l.* in dividends. The agent, who was manager of the mine at the time, is still alive and hearty, we hope, and will remember all this.

Now there are two kinds of mining—real mining and market mining, and we go in for the former. Prince of Wales, as our correspondent says truly enough, has been a sad drag. But we have not only carried on the largest interest in it, but have also had to advance money constantly through the apathy of shareholders in regard to calls. We get, and have never got, any benefit out of the mine whatever, but look very shortly to be amply rewarded in a good mine. It was the same in Crebor; the calls were so constant for a few years that shares came down to 1*l.* 6*d.*, and month after month we, as treasurers, had to advance the costs—otherwise the mine would have stopped, instead of becoming, as it soon did, one of if not the best copper mines in Cornwall. Do not, therefore, be afraid either of Prince of Wales or West Crebor; they may both turn out prizes yet, and being on the Cost-book System can be carried on, unlike some of equally good prospects under Limited Liability, with no want of fresh capital. We cannot control markets in dull times, and do not much regard them so long as mines continue right.

The Prince of Wales sells rather more than 100*l.* worth of tin per month from 12 heads of stamps, worked by night only. We are now erecting 12 heads more, so as to double the returns. We cannot at present say what the copper sampling will fetch, but the returns this four months will exceed the last in amount.

Before the water fell off at East Blue Hills, so that the stamps could not be worked, the mine was doing well, and as the water becomes plentiful will do well again. In April the tin sold realised 129*l.* 15*s.* 4*d.* in May 1817, 15*s.* 11*d.*, and the cost of this month was 150*l.* In June the sale had increased to 259*l.* 12*s.* for the month, at a cost of 175*l.* Then the water began to fail, so that June sale was only 92*l.* 10*s.* 7*d.*; July, 75*l.* 12*s.* 10*d.*; August and September nothing. The agents are now stamping the accumulated ores.

There is a fine lode in the 55 west, at Prince of Wales; this is on the new discovery; the lode is 4 ft. wide, producing good rocks of tin. It is in whole ground to surface.

We understand the call at the meeting will be much less than the last; and that for the following four months the returns will still further increase.

On the Stock Exchange the principal business has been done in Mexican Railway stock, which has fallen over 15 per cent. during the week and about 20 per cent. since the last settlement. The dividend just announced of 4 per cent. for the half year ending June 30 is considered very unsatisfactory, though part of the falling off in dividend is accounted for by "increase of working expenses of a peculiar and accidental character," and that the Mexican Government owes to the company for freight carried an amount equal to about 1 per cent. dividend. Matters, however, do not look very hopeful for the shareholders with a continual falling off in the Traffic Returns (9000*l.* decrease last week), and no prospect of any immediate improvement. English Railways are somewhat better. North British, Great Western, Metropolitan District, London and North-Western, and North-Eastern being over 1 per cent. higher. Foreign stocks are dull, with but little business doing in them. Mexican Three per Cents. are lower, the fact of the Government being in arrears with the railway company having a bad effect on the market. American and Canadian Railroad stocks are steady; Grand Trunks have relapsed somewhat, the traffic return being considered disappointing.

FOREIGN MINING AND METALLURGY.

There is still no news to communicate with respect to the Belgian Coal Trade. The demand has not increased for industrial and metallurgical coal; but, on the other hand, it has not fallen off as regards household coal. Quotations have remained generally at their former level; but the reduced demand on the part of the Belgian Iron Trade has occasioned some weakness in industrial coal. Stocks are comparatively limited. The number of trucks carrying coal and coke which passed over the Belgian State Railways in the week ending Oct. 28 was 20,772, as compared with 20,341 in the corresponding week of 1882, showing an increase of 431 this year. The German coal trade is considered to be somewhat improving. The demand has become larger and transactions have been carried through with more activity; in one district complaints are being made in consequence of an insufficient supply of rolling stock. We learn that sundry Westphalian collieries have offered to contribute 12,500*l.* to assist the construction of a canal from the Rhine to Ems. In Upper Silesia some of the collieries have advanced the price of their production 10 pfennigs per ton, as from the 1st instant. Other colliery proprietors will probably follow their example. The extraction of coal in the Dortmund district in the third quarter of this year amounted to 7,009,403 tons, as compared with 6,777,158 tons in the corresponding quarter of 1882, showing an increase of 232,245 tons this year. The deliveries from the Dortmund district in the third quarter of this year were 7,013,078 tons, as compared with 6,801,265 tons in the corresponding period of 1882, showing an increase of 210,513 tons this year. The imports of coal into Germany in the first eight months of this year were 1,449,018 tons, while the exports from Germany in the same period amounted to 5,450,114 tons.

The Belgian Iron Trade remains in much the same state. Complaints are still heard of a scarcity of orders, and workshops fully employed are quite the exception. A few establishments have their production engaged until January; but, taking a general view of matters, it must be acknowledged that order-books are poorly filled for next year. The forges and rolling mills are only assured employment for a few weeks in advance. Under these circumstances the works are offering their production rather more urgently for sale. English pig can now be procured in Belgium a little below 27*s.* 9*d.* per ton. Business in refining pig has been restricted; at the same time a quotation of 2*l.* 4*s.* per ton has been generally maintained, while ordinary pig has sold for 2*l.* per ton, and mixed pig at 1*l.* 16*s.* per ton. The Athus-Halanzy group maintains its price at from 1*l.* 18*s.* 4*d.* to 1*l.* 19*s.* 2*d.* per ton. Iron has been in no great request. If business is still done upon the old basis price for No. 1, some concessions are made as regards higher numbers. There is not much doing in girders; at the same time they cannot be obtained below 5*l.* 4*s.* per ton. There has been scarcely any change in plates, No. 2 having been maintained at 6*l.* 16*s.*; No. 3, at 7*l.* 12*s.* per ton. Experiments made at the Brasschaet Polygon with cannon manufactured by the John Cockerill Company have been attended with satisfactory results, the guns having resisted all the tests to which they were exposed. It is hoped, ac-

cordingly, that in future Belgium will be able to make its own cannon, and that it will not be tributary, as hitherto, to Krupp, of Essen. The Malines Construction Workshops are stated to have secured some important orders on foreign account.

There has been no important change in the condition of the French Iron Trade. Producers show a strong determination not to make any change in quotations; on the other hand, business at Paris is not carried through very freely or readily, and the average price obtained for iron does not exceed 7*l.* per ton, terms which leave scarcely any profit to merchants, having regard to the rates insisted on by the ironmasters of the Nord. Steel rails have shown a downward tendency of late. The Orleans Railway Company has recently let a contract for 8000 tons of steel rails, and almost all the French steelworks took part in the adjudication. The tenders submitted were about 7*l.* 4*s.* per ton, but two works made much lower proposals, the Denain having offered to deliver rails at 6*l.* 9*s.* 4*d.* per ton, and the Steelworks Company of France at 6*l.* 7*s.* per ton. This may be regarded as a first result of the competition, which has commenced in consequence of the great extension of the productive powers of French metallurgy during the last two years. The state of mechanical and metallurgical industry in the Austro-Hungarian Empire may be regarded as favourable. Work is so general, and orders are so important that an advance is shortly anticipated in prices. The construction workshops are as well employed as the works producing raw materials. As regards the forges they are so overdone with orders that they find it difficult to obtain all the pig which they require. The Hungarian Minister of Commerce has just given out orders for the *matériel* required for the Transversal Gallician Railway. The house of Borsig, of Berlin, which submitted a lower tender than any other offer made by Austro-Hungarian works, obtained an order for 10 goods locomotives. The Florisdorf Works and the Vienna-Neustadt Works divided between them another order for 25 goods engines, and an order for ten passenger engines was given to the Staatsbahn Works. There is no material change to report in the tone of the German iron trade. The demand for pig has remained feeble, but there has been a slight improvement in the enquiry for iron. Iron wire has been neglected, but plates continue in good demand, and the steelworks are well provided with orders. Some fresh adjudications have taken place during the last few days, and have assisted in maintaining activity at the works. Thus the Frankfurt Steelworks Company of the Rhine has secured an order for 2200 tons of rails at 7*l.* 6*s.* 7*d.* per ton, while Messrs. Roehling, of Voelklingen, have taken an order for 1837 tons of iron sleepers at 5*l.* 15*s.* 2*d.* per ton, and 72 tons of fish-plates at 5*l.* 14*s.* per ton.

shaft is suspended for the time, and the men put to drive east on Long's lode, which will prove this end and intersect the eastern part of east lode, which we believe will be the most important part. The pitches in this part of the mine are without change to notice. Baynard's shaft is cleared to the 60, and also the cross-cut from this shaft west to Middleton's lode. This level is now being cleared on Middleton's lode to communicate with Penrose's engine-shaft. This being done will thoroughly ventilate this part of the mine, and enable the workings to be carried on with more freedom. North Wheal Rose. The first 35 plumb-lift will be fixed complete by the end of this week, so that the work for the lift to the 60 will be commenced in the early part of next week, and as quickly as this can be finished, the 100-in. engine will be set to work, and the mine rapidly drained below.

GAWTON.—G. Rowe, Nov. 3: The part of the lode carried in the 117 east is 6 ft. wide, showing an improved appearance, and yielding sulphur and arsenical muriatic, with good quality copper ore, to the amount of 6 tons per fathom. All the stoping ground in the back of this level continues without change. The stopes in the bottom at the 105 east is yielding 10 tons of arsenic and muriatic per fathom. No. 1 stopes in the back of the 105 east will yield 7 tons per fm. The lode in the 95 east is 4 ft. wide, yielding good quality muriatic, with occasional rich stones of copper ore. The stopes in the 92 west is yielding 7 tons of muriatic per fathom. The lode in the rise and stope, in back of the 70 east, is yielding 9 tons of muriatic per fm. No. 2 stopes in the back of this level is yielding 6 tons of muriatic per fathom.

GLASGOW CARADON CONSOLS.—Wm. Taylor, Wm. J. Taylor, Nov. 3: The ground in the engine-shaft is just the same as last reported. We are urging on the sinking as fast as possible, have now set two months stent, the men have a premium if they do the task allotted to them in the time. In the 114, west of Harvey's lode, the ground and lode is improving, producing good stones of ore; a very promising end, and likely further to improve. In the 90, west of Harvey's north lode, we are driving on the south branch just cut into, worth 5*l.* per fm., with another part standing to the north, which we think will unite a short distance ahead; this will, we expect, open a good run of ore ground. These points we are pushing on as fast as possible. The stopes at the different levels vary in value from 8*l.* to 10*l.* per fathom. No change to notice in the tribute pitches, which are turning out about their usual quantities of ore.

GOODREVE.—R. Knot, Nov. 6: The engine-shaft lode continues to present a very kindly appearance. We have opened on it now for about 4 fms. in width, all of which is being put to stamps, and in this part of the mine is about a premium if they do the task allotted to them in the time. In the 114, west of Harvey's lode, the ground and lode is improving, producing good stones of ore; a very promising end, and likely further to improve.

GREAT LAXEY.—W. H. Rowe, Nov. 7: The 271 driving north of Welsh shaft is so far in a rather coarse description of lode with only small spots of blonde. The cross-cut in the 259 end north not showing the country rock satisfactorily we are continuing it a short distance further to fully prove the ground at this point. There is ledgestuff for over 12 ft. in width with a little blonde in places which we would prefer to see more concentrated and the lode more compact. In the 247 the eastern branch (upon which the end has latterly been driving) continuing poor, we have now commenced a cross-cut westward towards the other division of lode. The winze near this end from the level above is nearly holed, and will lay open for stoping some fairlly good blonde ground. In cross-cutting quite through the lode in the 235 north a branch of ore was met with, worth 12*l.* per fathom, but in driving southward towards the winze sunk from the 220 the lode has again become poor. The engine-shaft will be deep enough for the 247 this week, when we shall cut through the footwall portion of the lode, which, so far as can be seen, shows some good ore. No more ore of consequence has been met with in the 235 end south, the lode in which, however, continues of a strong masterly character. The cross-cutting west in 100 south has intersected a run of flooan stuff and a wall corresponding in bearing but not in underlie with that of the lode. We are inclined to think this will at least prove to have some connection with the regular lode, but after a little further cross-cutting shall be better able to say. Excepting an improvement in the winze in the 139, which is now worth 25*l.* per fathom, the other points in the deep mine are without material change. Dumbell's: After completing the casing, &c., of this shaft to the bottom the cross-cut west to the lode is now being made, and will, we expect, reach it in about 3 fms. The 230 end north is worth 15*l.* per fathom. The 200 end 15*l.* per fathom. The 185 has fallen off considerably since last report, now worth only 12*l.* per fathom. The 170 end has improved to 20*l.* per fathom. A new winze in 185 to ventilate the workings in the 200 roof is worth 20*l.* per fathom, and another in a similar position in the 200 12*l.* per fathom. The stopes throughout this section of the mine have very little alteration in value since our full report. We have suspended for the present the driving of the 70, south in middle ground, and commenced to rise and stope in the ore passed through. The late improved prospects in the adit end north on the eastern branch are interrupted by a slide, and the lode at present disturbed.

GREAT WEST CHIVERTON.—John Curtis, Nov. 3: In the 20 fm. level east the lode is 20 in. wide, with a leader of lead 2 in. wide, and looking to be more permanent than any thing we have heretofore seen in the mine. In the 20 west the lode is near 3 ft. wide, composed of fine quartz, white prian, intermixed with fine lead; on the whole we are looking much better. I think the improvement in the 20 east is the shoot of lead which has been talked about and seen in the lode at present disturbed.

GREEN HURTH.—Jas. Polglase, Nov. 1: The 44 end north is worth about 3 tons per fathom. No. 1 stope, south of No. 1 winze, is worth 2 tons per fathom. No. 2 stope, south of No. 1 winze, is worth 2 tons per fathom. No. 3 stope, south of No. 1 winze, is worth 4 tons per fathom. No. 4 stope, north of No. 1 winze, is worth 5 tons per fathom. A stope in back of Standage level is worth 3 tons per fathom. The trial drift, 30 level, is worth 1 ton per fathom. No. 2 vein continues about the same. Dressing going on well.

HARDSHINS.—Manager, Nov. 2: We are still shooting in the Sun side of the vein going west, and in doing so get a little more of the vein. We came in contact with some very hard whinstone which we expected in the whin sill. This being the case we have not so much ore, but expect to get the hard stone shot down shortly.

HAREHOPE GILL (Edmondshires).—George Robson, Nov. 3: During the past fortnight No. 2 east has been driven 3 fms., and No. 2 west 10*l* fms. without any material increase in the quantity of water, which is still small.

HEALEYFIELD.—J. Trelease, Nov. 2: There is not much change in any of our underground operations worthy of note during the past week. The Whitewell shaftmen will sink about 9 ft. this week, which depth will bring us to the random of the Derwent level. We have the same plate-bed on the east side of the bottom of the shaft as that which the Derwent level was driven in. We have started the crushing machinery again, and the fine weather has been quite opportune for dressing during the week. We have had a little better success at the Derwent level, having met with a few fathoms of open level.

HINGSTON DOWN.—Thomas Richards, Nov. 7: Having completed the skip-road, dividing, casing, &c., the driving of the 52 east has been resumed; there is not much change in the lode, which contains capel, quartz, muriatic, &c., and a little yellow copper ore, with an increase of water. In the 40 east the lode is large, containing arsenical muriatic, quartz, capel, &c., and occasional stones of both copper and tin.

MELLANEAR.—John Gilbert, Nov. 7: In the 30 cross-cut, driving south of Gundry's shaft, the ground is very promising in appearance, being mineralised throughout with veins of muriatic and lead; judging from indications it ought to be very near a lode. In the 70 cross-cut, north of the main lode, east of Gundry's shaft, the ground is still mixed with a good deal of muriatic, and is a little easier for driving. The lode in the 80, driving west on south part, is 3 ft. wide, and yielding 1 ton of ore per fathom; it is rather disordered, but we think in going westward it will get more settled, and improve in value. The lode in the 100, driving west of shaft, on main part, is 5 ft. wide, yielding 2*l* 2*s.* tons of ore per fathom, and looking promising to open out a good piece of ground. In the 110, driving west of shaft, on south part, the lode is 6 ft. wide, yielding 1 ton of copper ore per fathom, and some saving work for tin. In the 110, driving east of shaft, on main part, the lode is 4*l* 6*s.* wide, and yielding 1*l* 1*s.* tons of copper ore per fathom. The lode in the 120, driving east of shaft, is 3 ft. wide, and yielding 1*l* 1*s.* ton of copper ore per fathom, but we expect it will improve again very soon. In the 120, driving west of shaft, the lode is 4*l* 6*s.* wide, and yielding 3 tons of ore per fathom, but wet and troublesome for driving. In the rise in the back of the 110, at Gundry's shaft, the lode is 4 ft. wide, and yielding 2 tons of ore per fathom. The lode in the rise in the back of the 120, east of Gundry's shaft, is 4 ft. wide, and yielding 2*l* 2*s.* tons of ore per fathom. The lode in the rise in the back of the 120, west of Gundry's shaft, is 5 ft. wide, and yielding 3 tons of ore per fathom. In the winze in the bottom of the 100, west of the old engine-shaft, the lode is 3 ft. wide, and yielding occasional stones of copper ore.

MID-DEVON COPPER.—J. Neill, Nov. 3: A Shaft: In draining water below the 50 preparatory to sinking we have had some trouble to get the bucket to draw water. We have raised the lift above the accumulation of sediment and debris, and overhauled the whole length of the lift (6 fms.) above the water, removed all the joints, and changed the value. All has now again been placed in position, and the water is now in fork to 5*l* fms. deep. There are 3 ft. of debris at bottom of shaft to be cleared. We are laying on pipes to convey the compressed air to the bottom of shaft to work the drill, and hope to have all in order for sinking by end of next week. C-Shaft: The stope in cross-cut north in extreme end of 50 east has been partially worked by two men and two boys with rock-drill. There is no change to notify in its appearance, and will still yield 2 tons of ore per cubic fathom. The men have been employed assisting at the work in main shaft when required.

MONA CONSOLS COPPER.—T. Mitchell, Nov. 7: There is not much change in the bottom driving since my last report. The lode consists principally of quartz intermixed with patches of kilias, and producing occasional stones of copper ore. The engine and pitwork continue to work satisfactorily.

MOSTYN CONSOLS.—J. Woolcock, Nov. 3: We have the mine clear of water, and men have again resumed work in both the east and west levels. In the east driving we have a strong masterly lode, composed of clay and spar, and occasionally good stones of solid ore. To-day while underground in company with Capt. Eustace we broke some splendid ore, and from the appearance of the lode we may expect to meet with a strong course of ore any day. The 23 yard level still yields good stuff for dressing-floors. Capt. Eustace's report no doubt you will see in due course.

MOUNTS BAY CONSOLS.—W. Argall, John Rowe, Nov. 3: No. 1 Lode: The 20 driving west of new shaft is worth 6*l.* per fathom. The 20, east of Penrose's lode is worth 5*l.* per fathom. We have eight tribute pitches working on this lode at 13*l.* 4*s.* in 1*l*. The 10 cross-cut driving from the engine-shaft (No. 2 lode) is still in congenial ground, and we are anxiously looking forward to the cutting of the No. 4 lode, which we expect to cut good. We have five tribute pitches working on Nos. 2, 4, 5 and 7 lodes at 15*l.* in 1*l*.

MOUNT CARBIS.—W. Tregay, Geo. Johns, Nov. 3: The shaftmen have very nearly completed the dividing the shaft, fixing footway, &c., from the 50 to the 60 fm. levels, and will be cross-cutting towards the great flat lode by latter part of this week. The lode in the whin and stope bottoms of 50 is worth 25*l.* per fm. The pipe going down north-east from the carbons in the 38 is still producing some rich tintuff. All other pieces as reported.

NEW CARADON.—N. Richards, Nov. 7: The pitwork referred to in last week's report is all on the mine, and most of the parts of water-wheel, and the men are to-day engaged getting the axle in its place, the putting together of which will with the other necessary work be forced on with all possible dispatch.

NEW KITTY.—Wm

50, driving east of this shaft, on the West Kitty lode, is very kindly in appearance, producing a little tin.

NEW TERRAS.—J. D. Fraser, Thos. Edwards, Nov. 8: The ground in the new shaft continues of a beautiful character for sinking. There are branches of tin passing through this shaft. The heavy rain during the past week has some what interfered with our surface operations, still we have made good progress considering the unfavourable state of the weather. We hope to complete our stamping and pumping machinery in about a fortnight or three weeks.

NEW WEST CARADON.—N. Richards, Nov. 7: Fair progress is being made in driving the 38 cross-cut, south of Hallett's shaft, in which we are often intersecting veins and small branches, which we are pleased to see. No. 5 lode on which we are driving east at this level is improving in appearance as we are leaving the cross-course. The Little North lode on which we are driving west at this level is producing saving work for copper. Twostops in the back of the 30, on the main lode, will yield together 2 tons of copper ore per fathom. A stop in the back of the 40 on this lode will yield from $\frac{1}{2}$ to 1 ton of ore per fm.

NORTH BLUE HILLS.—S. Bennetts, Nov. 7: The north lode in the winze below the adit varies from a few inches to a foot in width and contains some little tin-stuff. The principal north underlying lode, however, on which the former workers had the tin is further north and just beyond the elvan course.

NORTH BUSY UNITED.—John James, Nov. 7: The lode in the 22 driving east is not quite so large, but producing good stones of tin. The stop in the back of the 22 is of the same value as last reported. In the stop in the bottom of the 15 the lode is improving, and producing some splendid stones of tin. The stop in back of the 15 is communicated with the rise; the lode is larger, and has a better appearance. We have a full supply of water at the stamps, and are pushing on with all speed towards another sampling.

NORTH GREEN HURTH.—James Polglase, Nov. 7: The deep adit cross-cut is without change. The vein in the south drive from deep adit looks more promising. Nothing new in the Hospitable property.

NORTH TRESKERBY.—Pryor and Son, Nov. 8: The deep adit level has been again set to drive east of cross-cut on No. 2 lode at 31. 10s. per fathom, and to stop the back of this level, west of cross-cut, on No. 1 lode, at 31. 5s. per fathom. The lodes at these points continue just the same in value as reported on last week. Owing to the timber failing at the mouth of the shallow adit level, north of Scorrier Consols engine-shaft, rendering it dangerous for cattle, we are compelled to take the men from driving the deep adit level east to accomplish this work. The surface work referred to last week is being pushed on so far as circumstances will permit.

OKEL TOR.—H. Bulford, J. Rodda, Nov. 8: There is no change to report this week.

PANDORA.—Nov. 8: No. 1 East and West Lode: The 45, west of shaft, is producing good saving work for lead and blende, and I think will further improve shortly. No. 1 stop, in back of this level, is producing 3 tons of lead and blende per fathom. No. 2 stop 15 cwt. per fm.—Goddard's Lode: The stops in back of the 33 is just the same as when reported on last week. The stops in the 23 are idle for the time being. Men refused bargain.—No. 2 East and West Lode: Since last report we have cut into the hanging of this lode in the winze sinking below the 13; this part of the lode is poor at present, and underlying very flat, showing just the same spar and country rock as we have lately gone through in the 23 cross-cut, and I purpose putting down another sink in the winze to make another, but shall stop the cross course whilst doing so. I am expecting the castings from the foundry to-morrow, and hope the dressing will be in full swing again next week.

PARYS COPPER CORPORATION.—T. Mitchell, Nov. 8: The ground in the 20, east of the cross-cut, has not undergone any particular change during the past week, but the end driving west of cross-cut at this place has a little improved in appearance, and producing good patches of copper ore, intermixed with sulphur and blende—a very kindly end.

PENHALLS.—S. Bennetts, J. Goyen, Nov. 7: There is no alteration worthy of notice in the 30 west end. In the 70 east end the lode, although small, is worth 5s. per fathom. In the winze just commenced below this level, on the north section of the lode, it is worth 5s. per fathom. In the 60 cross-cut north no further lode has been found. The cross-course, however, indicates more lode near at hand. The Baldhu lode in the 42 west end is not quite so tinny as last reported.

PEN-YR-ORSEDD.—R. Prince: The beds in the 150 south cross-cut have taken to dip very rapidly, and we must be near a lode. The water in the bottom is now only 18 in., so I look with great pleasure to resuming operations upon the lode struck in a few days.

PHOENIX AND WEST PHOENIX UNITED.—John Truscott, Nov. 8: Setting Report: To stop the back of the 130 west, by four men, at 31. per fathom; worth per fathom 14s. No. 1 stop in the back of the 120, by six men, at 22. 15s. per fathom; worth per fathom 10s. No. 2 stop in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 13s. To stop the back of the 110, by four men, at 41. 10s. per fathom; worth per fathom 12s. To drive the 60 west, by two men, at 61. 10s. per fathom; lode at present unproductive. No. 1 stop, in the back of this level, by four men, at 22. 12s. per fathom; worth per fathom 15s. No. 2 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 17s. No. 3 stop in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 17s. No. 4 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 20s. No. 5 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 22s. No. 6 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 24s. No. 7 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 26s. No. 8 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 28s. No. 9 stop, in the back of this level, by four men, at 22. 15s. per fathom; worth per fathom 30s. Three pitches were set at tributes varying from 8s. to 12s. in 12 ft. for tin and copper.

POLOREBO.—W. H. Martin, Nov. 7: On Saturday last we set the following bargains:—Highburrow Shaft: We set to the six shaftmen to fix bearers and cistern at the 30; contract 6s. We shall complete the work this week, after which we hope the sinking will be kept going without delay until we reach the 40. The 30, to drive east, by four men, at 31. 10s. per fathom. The 30, to drive west, by four men, at 41. per fathom; after this level is sufficiently driven I purpose to rise against the winze sinking under the 17, not only to open the tin ground, but to ventilate the 30. The winze to sink under the 17, by four men, at 41. 10s. per fathom. The 30, to drive east of the engine-shaft, on the north part of the lode, by four men, at 22. 10s. per fathom. The tributaries are preparing a parcel of tin-stuff for sale.

POLOREBO.—W. H. Martin, Nov. 7: We have driven the 122 east about 10 ft., so I have now put the men to take down the ground on the south side of the level to make the plat, and also to reach the part of the lode, which is still standing to the south, and which I think is the main part of the lode; if it proves to be so we shall drive on it when the plat is finished. The lode in the 122 west is about 2 ft. wide, composed of peat, spar, mundic, &c., with a little tin. We are making good progress with the 112 east; the lode is 2 ft. wide, of a promising character, being very strong, with mundic, carrying a little tin. We have about 3 fms. to drive this end to get under the winze below the 100.

PRINCE OF WALES.—S. Roberts, Nov. 7: During the past week fair progress has been made throughout the mine. We have no perceptible change to notice in either ends or stope since last report.

PWLLMELLYN.—J. Woolcock, Nov. 8: In the driving in the 34 yard level we are still rising good ore for dressing-floors. I am pleased to inform you that yesterday we made a good discovery in the western portion of the lode, quite as good as we have yet seen in the mine. On the whole the mine never looked better.

ROMAN GRAVELS.—A. Waters and Son, Nov. 8: The 125, north of the new engine-shaft, is in a lode worth $\frac{1}{2}$ ton of lead ore per fm., and there is every prospect of a good improvement here shortly. The same level going south is worth 1 ton per fathom, and will soon be better. The 110, south of flat-rod shaft, on the east lode, is worth 1 ton per fathom. The 110, south of new engine-shaft, on Roman lode, is worth 3 to 4 tons per fathom. The 95 south is worth 3 tons per fathom. The 82 south is also worth 3 tons per fathom. The 80 north-west, on caunter lode, is yielding good stones of lead ore; this is quite a new trial in virgin ground, and the junction of caunter with the Saw-pit lode never having been driven to. We consider a discovery of importance is likely to be made as we go out here. The stope throughout the mine are yielding ore in quantities equal to the average of the last six months. We have to-day sold 250 tons lead ore for 17s.

RUSSELL COPPER.—John Goldsworthy, Nov. 5: To-day a communication has been effected from the rise in the back of the 26 to the adit, the distance being full 17 fms.; this has given good ventilation. The lode in the rise will be taken down; when taken down last was worth 8s. per fathom. As soon as completed the men will be placed in the 26 west to drive on the course of the lode; the same is 2 $\frac{1}{2}$ to 3 ft. wide, composed of quartz, prian, capel, white iron, and copper ore. Judging from its fine appearance an early and important improvement is expected. There is no other change to remark since last advised.

SINCLAIR.—We are passing through very loose ground in the 50 cross-cut south, and our winding-engine is kept going, bringing some rich stuff to surface. Evidently we are under the influence of the junction of lodes, and a sanguine of great results; full report in my next. Not a moment is being lost.

SORTRIDGE.—J. Axford, Nov. 8: There is no alteration in the 40 cross-cut north either in the character of the ground or the rate of progression.

SOUTH CARADON.—W. George, Nov. 7: Setting Report: Rule Shaft: To drive the 210 east, by six men, with the boring machine, where the lode continues to look very promising, and producing a ton of ore per fathom. Driven in the past month 5 fathoms; these men have been partially employed in assisting the shaftmen to fix new rods, pitwork, &c.—Kittow's Shaft: To drive the 150 east, by nine men, with boring machine. During the month the ground has not been quite so favourable, measured 8 $\frac{1}{2}$ fathoms; the lode continues to yield 1 ton of ore per fathom. To drive the 170 east from the winze, by four men, at 5s. per fathom lode yielding 1 $\frac{1}{2}$ ton of ore per fm. To drive the 160 east, by six men, at 5s. 10s., yielding full 3 tons of ore per fathom. This end being in advance of either of the others referred to in this report we consider is most encouraging for the future of the levels, as well as for the deeper alluvages which are being urged on to get under this long run of ore ground. Two men are employed here to further prove some branches in the south side. To stop the back of this level, by four men, at 32. 10s., yielding 2 tons of ore per fathom. To drive the cross-cut north from the 150 end, by six men, at 14. per fathom. To drive the 145 east, by four men, at 5s. 10s., where the lode continues to yield 1 $\frac{1}{2}$ ton of ore per fathom, and instead of driving west on this part of the lode as at first intended we have started to sink winze with the view of ventilating the same and the level below, as well as for laying open available ground for stopping, which is set to six men, at 5s., where the lode will yield full 2 tons of ore per fm.

To drive the 120 east, by four men, at 9s. 10s., yielding full 2 tons of ore per fm. To sink the winze below the 110, by six men, at 12s.; the lode here has improved, and is now yielding full 2 tons of ore per fathom. To drive east from a rise in the back of this level, by two men, at 7s. 10s. per fathom; the lode is producing saving work, but for the present not of much value. To drive the 110 east on the south part of caunter lode, by four men, at 12s. per fathom; the ground being harder the lode is at present disordered, but still producing good saving work. To rise in the back of this level by six men, at 7s. 10s., yielding 1 ton of ore per fathom. To drive the 70 west on Kittow's lode, by four men, at 10s. per fathom; the lode having continued small and unproductive, and the end being nearly far enough west to be under the bottom referred to in the last report, it is not improbable the main part of the lode worked from the 60 is to the south of this drivage, and without an early improvement we shall cross-cut to prove this. To drive a trial cross-cut south at the 60, by four men, at 3s. 10s. per fm. There are set and being worked in different parts of the mine 58 pitches, by 117 men, at tributes varying from 10s. to 1s. 4d. in 1 $\frac{1}{2}$. We have computed our present sampling for sale on the 22nd inst. at 10s. per fathom.

SOUTH CONDURROW.—Wm. Rich, Nov. 7: There is very little alteration to notice in the underground operations since our report last week. We are busily at work, putting in new boxes to the stamps.

SOUTH DARREN.—John Mitchell, Nov. 8: We are pushing on the 130 ends as fast as possible. In the eastern end we have a strongly defined lode; the character of the rock is also very congenial for lead; the end is at present worth 1 $\frac{1}{2}$ ton of silver-lead ore per fathom. In the western end we are making good progress in driving, considering the hardness of the ground. We have commenced to drive to meet the 130 end men from the bottom of the 120 winze west; the lode looks very promising, and is worth 1 $\frac{1}{2}$ ton of silver-lead ore per fathom. The 110 end east is a little harder for driving. We have seven stops in the 120 worth from 15 cwt., to 2 tons of silver-lead ore per fathom. We have had an assay of our ore, which gives the satisfactory result of 81 per cent. for lead and 30 ozs. of silver per ton. We have a good supply of water, and are pushing on with all speed towards another sampling.

SOUTH DEVON UNITED.—W. Hooper, Nov. 8: Setting Report: Martin's shaft has been sunk during the past month 1 fm.; better progress would have been made but for the men being engaged sending down pumps and making the necessary connections with Brook wheel for pumping from this shaft. This has been completed, and am pleased to say is working well. The lode in the shaft is everything that can be desired for the production of large quantities of ore, being the full width of the above (6 ft.), and worth 24s. per fathom, having 5 fms. stent to the men, consequently there is no alteration in the price this time. This is now being pushed on with all possible dispatch by nine men, and will no doubt lay open good paying ground. The 110, east of Brook engine-shaft, has been driven during the past month 3 fms.; reset to four men, at 8s. 10s. per fathom. The lode is 3 to 4 ft. wide, worth 6s. per fathom; the end is without any important change to call forth any specific remark since last reported on. No. 1 stop in the back of this level is reset to four men, at 3s. 10s. per fm.; the lode is 4 ft. wide, worth 9s. per fathom. No. 2 stop is reset to four men, at 3s. 10s. per fm.; the lode is 4 ft. wide, worth 8s. per fathom; the lode, set to four men, at 3s. 5s. per fathom. In No. 2 ditto the lode is 3 ft. wide, worth 7s. per fathom; set to six men, at 3s. 12s. 6d. per fathom. The 100, east of Brook shaft, has been driven during the past month 1 fm. 3 ft.; reset to two men, at 5s. 10s. per fathom. The appearance of the end has very much improved, the lode now being from 2 to 3 ft. wide, composed of spar with mundic, and stones of copper ore. The 97, east of Brook shaft, has been driven during the past month 1 fm. 6 in. through a lode varying in width from 4 to 5 ft., composed of capel, spar, mundic, and occasionally good stones of ore. A stop in the back of this level to six men, at 3s. per fathom; the lode is 3 ft. wide, worth 8s. per fathom. The 70, west of Old Sump shaft, has been driven during the past month 1 fm. 5 ft.; reset to two men, at 4s. per fathom; the lode is fully 5 ft. wide, producing gossan, spar, and mundic and stones of rich copper ore.

SOUTH PENSTRUTHAL.—S. Davey, Nov. 8: I am pleased to inform you that I never saw a finer looking lode in any mine than we now have in the 150 flat rod shaft. It is open full 8 ft. wide, no wall, and full of mineral; but not sufficient copper yet to save. I invited several mining men to see the lodestuff as drawn up, and there is but one opinion, that we shall soon be in a bunch of copper.

SOUTH TOLCARNE.—Thomas Angove, Samuel Arthur, Richard Ure, Nov. 7: The 80 end west on Fraser's lode is large, worth 9s. per fathom. In the 70 the stops east and west of shaft are looking much the same, worth about 8s. per fathom. The stop on the flat lode east of shaft at the 60 is worth 7s. per fm. We are driving a cross-cut south to cut the flat lode at this level, 50 fathoms east of the shaft, which we expect to intersect shortly. The 60 end west is in an elvan course, and the lode much split up; we have suspended it for the present. As our flat lode in the 50 end east is looking more promising going towards the eastern ground, we have removed the men 40 fathoms further east at this level to cross-cut it from Fraser's lode, which will develop the ground much quicker and with less expense; the distance to drive the cross-cut will be about 8 to 10 fathoms. There is no change on the flat lode driving west at the adit level. The winze sinking on Taylor's lode under the 12 is worth for length of winze 30s. per fathom (Gossan shaft). The skip-road is completed to the 35, which will enable us to commence stopping here. We are stopping above the 12 at Taylor's, where the lode is producing good work for tin. We have no other change to report in the mine.

TANKERVILLE GREAT CONSOLS.—A. Waters and Son, Nov. 8: Bog Mine: The 185 west is driven 33 fms.; lode in present end is 4 to 5 ft. wide, worth for lead ore and blende about 5s. per fathom. The stop behind the forebreast, by four men, at 35s. per fathom, is worth 20 cwt. of lead ore and 25 cwt. of blende per fathom. The 185 east of new shaft is 4 to 5 ft. wide, worth for lead ore and blende about 5s. per fathom. In addition to the forgoing there are 14 pitchets by 34 men, at 80s. per ton of lead ore, and varying from 30s. to 3s. per ton of blende, worth together about 3 $\frac{1}{2}$ tons of lead and 12 tons of blende per fathom. We hope to increase the numbers of tributaries shortly.—Pennerley, Warm Water Lode: The stop in 12s. east of cross-cut (new ground), working by aid of rock-drills, is worth 20 cwt. lead ore per fathom. The 33 going west of new shaft towards the shale, by rock-drill, is a lode worth 3 tons lead ore per fathom. The 33 going east, by hand, is also worth 3 tons per fathom. The stop below 30 going down shale-end of 93 west is worth 4 tons per fathom. The stop below 30, east of shaft, is worth 30 cwt. lead ore per fathom. The stop below 30, east of cross-cut, is worth 25 cwt. per fathom. There are three pitches, by six men, at 11s. per ton of lead ore, worth at present 30 cwt. of lead ore per fathom.

TOTTERIDGE.—Potter's Pit: The water has again risen in the bottom of this mine—has come up. We are stopping bottom of latter level from winze east towards the shale, by four men, at 4s. per fathom; worth per fathom, 16s. The 40 to drive west, by four men, at 4s. per fathom; worth per fathom 15s. No. 1 stop in the back of this level, by four men, at 4s. per fathom; worth per fathom 22s. No. 2 stop in the back of this level, by two men, at 3s. 15s. per fathom; worth per fathom 14s. No. 3 stop in the back of this level, by four men, at 4s. per fathom; worth per fathom 16s. No. 4 stop in the back of this level, by three men, at 3s. 15s. per fathom; worth per fathom 10s. No. 5 stop in the back of this level, by three men, at 3s. 15s. per fathom; worth per fathom 14s.—Stowe's Shaft: To stop the back the 60 east of this shaft, by six men, at 3s. per fathom; worth per fathom 30s. Three pitches were set at tributes varying from 8s. to 12s. in 12 ft. for tin and copper.

TREASVEAN.—J. Prisk, W. Edwards, Nov. 5: The water is drained throughout the mine to the 125, and seems to be rising at the rate of 10 in. in 24 hours. We are stopping roof of 125 west above water-line, lode worth 20 cwt. of lead ore per fathom. The 55 west of cross-cut, on Wilson's lode, is worth 50 cwt. of lead ore per fathom. The 55 east of cross-cut, on Wilson's lode, is worth 70 cwt. per fathom, but we expect an improvement at this point shortly. There are three pitches working, by six men, at 11s. per fathom; and (one) at 10s. per fathom; worth together about 20 cwt. lead ore per fathom. The 40 to the 30, to the 25, to the 20, to the 15, to the 10, to the 5, to the 2, to the 1, to the 0, to the 50 fms. long, will yield from 1 to 2 $\frac{1}{2}$ tons of ore per fathom; the greater part of the length being of the latter value, on which two stope from the roof of the level are now being profitably wrought.

TRE

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METAL MARKET—LONDON, Nov. 9, 1883.						
IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.	
Pig, smt., f.o.b., Clyde...	2	3 7½	—	English, ingot, f.o.b.	95	0 0
" Scotch, all No. 1 ...	2	5 0	—	" bars	96	0 0
Bars Welsh, f.o.b., Wales	5	7 6	—	" refined	97	0 0
" in London	5	17 6	Australian	59	10 0	
" Stafford	7	2 6	7 5 0	Banka	—	nom.
" in Tyne or Tees ...	5	17 6	Straits	59	10 0	
Swedish, London ...	9	0 0 9 19 0	COPPER.	—	—	
Rails, Welsh, at works ...	5	7 6	Tough cake and ingot	55	0 0 67 0 0	
Sheets, Staff., in London	5	3 8 15 0	Best selected	67	0 0 68 0 0	
Plates, ship, in London	8	10 0 15 0	Sheets and sheathing	71	10 0 75 0 0	
Hoops, Staff.	7	0 0 7 10 0	Flat Bottoms	74	10 0 78 0 0	
Nail rods, Staff., in Lon.	7	5 0 7 10 0	Waiharo	67	10 0 68 0 0	
STEEL.	—	—	Burra, or P.C.O.	67	0 0 67 10 0	
English spring	12	0 0 18 0 0	Other brands ... nom.	64	10 0 65 0 0	
cast	30	0 45 0 0	Chili bars, g.o.b.	60	10 0 —	
Swedish, leg	15	0 0 —	QUICKSILVER.	—	—	
fag. ham.	15	10 0 —	Flasks, 75 lbs., war.	5	5 0 —	
Rails at works.	4	10 0 4 15 0	PHOSPHOR BRONZE.	—	—	
" Light, at works.	6	5 0 —	Alloys I., II., and IV.	£114	0 0	
LEAD.	—	—	VII. and VIII.	135	0 0	
English, pig, common	12	0 0 12 2 6	" XI. Duro A, Duro B.	113	0 0	
" L.B.	12	10 0 12 12 6	BRASS.	—	—	
" W.B.	12	10 0 12 17 6	Wire	6½d.	7d.	
sheet and bar	13	0 0 —	Tubes	8½	—	
pipe	13	10 0 —	Sheets	7	7½d.	
red	15	0 0 15 10 0	Yel. met. sheet. & sheets	5½	6½d.	
white	18	10 0 20 0 0	TIN-PLATES.	per box	—	
patent shot	15	5 0 —	Charcoal, 1st quality	1	0 1 2 0 0	
Spanish	11	15 0 —	2nd quality	0	19 6 1 0 0	
Metal per cwt.	—	—	2nd quality	0	18 6 0 1 0 0	
Ore 10 per cent.	—	—	Black	per ton	15 10 0 —	
Silesian, ordinary brands	16	0 0 —	Canada, Staff. or Glas.	12	0 0 —	
special brands	16	2 6 —	at Liverpool	—	—	
English Swans	15	15 0 —	Black Taggers, 450 of	30	0 0 —	
Sheet zinc.	19	0 0 —	14 x 10	—	—	

* At the works, 1s. to 1s. 6d. per box less for ordinary; 1s. per ton less for Candi.; IX 6s. per box more than 10 quoted above, and add 6s. for each X. Tin-plates 2s. per box below tin-plates of similar brands.

REMARKS.—Our markets for the most part still remain in a very uninteresting condition; there is nothing to break the general monotony that exists, nothing to give tone to the markets, nothing to encourage buyers to come forward to stimulate the demand or to restore the trade to its normal condition. Rather as time advances the feeling appears to become more and more depressed, and everything is continued to be viewed through a gloomy medium. We have from time to time given various reasons for this unsatisfactory state of affairs, and have shown from what influences and causes the dulled commercial atmosphere is to be attributed, and here we need not recapitulate them, for there is no new feature, although perhaps some of the old circumstances of an adverse nature have developed and give cause for even still greater anxiety. We have shown on previous occasions how the bright aspects of the markets are more than counterbalanced by those of an unfavourable character, and now that the general gloom has been intensified, these bright features, like the sun on a foggy day, become obscure in the commercial mist. Nevertheless they exist, and when the clouded and dulled state of the markets becomes evaporated those bright features must shine forth and bear a very important influence upon the trade, giving cheerfulness where depression now exists, and making themselves still more marked and manifest because of the long time they have been kept from exercising their ordinary influences. But their effect will be in the future and not in the present, now, or at least for a time, the adverse features will in all likelihood predominate, but for how long must depend upon future events.

It is however noteworthy that there are few confident enough to believe in any speedy restoration, not even in the next few months, which time is invariably one of quietude, and much more now when everything appears black and dismal, but in the far future there is a good prospect of a development in business, and if producers will be but moderate in their supplies, there is also a good chance of realising better rates. But to deal more with the present and immediate future the chances of improvement are indeed remote, and operators realising this fact are very slow to make purchases, and more particularly for forward delivery, hence prices in some instances for forward prompts are lower than those for cash. This has been a feature which has characterised iron for a long time past, and now it has extended to tin, and even at the reduced rates scarcely any buyers can be found. At times there are fluctuations, but upon the smallest advance sales are pressed considerably, and prices are again reduced at least to as low a figure as they started from, and more often than not to still lower rates. The reduced prices for forward prompts, compared with those for cash, is a feature which calls for comment. It not only proves that there is only little or no confidence in the immediate future of the markets, but it also indicates that in all probability some great, not far distant, change must be made. It would appear that either prices for forward prompts must advance, or those for cash must recede. Of the two the latter seems the more probable, because there are unquestionably a large number of anxious sellers in almost all the markets, and very few buyers who will make purchases beyond their most pressing and urgent requirements, which they appear to limit as much as possible.

COPPER.—There has been only a small business doing in this metal, and day by day prices for Chili bars have assumed an easier tendency. With the exception of the falling prices there is no particular new feature in the market; general business appears to be quieter and some operators seem to think that owing to the large deliveries that have recently been made consumers must have pretty well satisfied their wants, and that future orders of a *bona fide* character are not likely to be so plentiful as they have recently been. At all events the risk is somewhat great, and, therefore, operators prefer to leave the market alone, and hence whilst it is neglected prices crumble away, being without any substantial foundation. The prospects are uncertain, and although there are undoubtedly some features of a favourable nature existing they are not allowed to exercise their usual influence, and they give no support whatever to the market. Perhaps one of the most striking features at the present time is the comparison between the market now and at the similar period of last year, the statistical position being almost precisely the same, but the ruling prices are now very much lower. We draw our readers' attention to this fact last week, not because it indicates any speedy restoration of prices, for at present higher rates do not seem probable. It is a feature that in good times, or when the prospects were fairly bright, would have been laid hold of by operators, and in all probability caused a considerable advance in prices, but now this beneficial result is not likely to take place there is no inclination whatever to buy, especially as the dulled winter season is fast approaching. Prices, however, just now are low, and, therefore, greatly reduced rates do not appear very probable, but at the same time until there is more life given to the market, until holders show a little more strength in their efforts to sustain prices, there is not likely to be any recovery, but the market may be expected to drag on in the same dull and uninteresting condition, with prices continually tending in buyers' favour.

IRON.—This market keeps in a very dull and uninteresting condition, and prices for the most part assume an easy tendency. The demand for Swedish iron is quiet, nevertheless sellers do not press sales very largely, and consequently transactions are not very numerous. It appears that better prices than those ruling here can be obtained

in Sweden, and, therefore, sellers are not anxious to send their iron to this market. Indian specifications are only in small demand, and in short bars there is only a small business doing. In general manufacturers confine their purchases to their most urgent requirements, both for consumption and shipment, and the low prices which for the most part continue to rule fail to produce any stimulus to the demand. Strike difficulties also still agitate the trade in some parts of the country; but little attention is given to these disputes between employers and employed, because they have been of so common an occurrence for a very long time past. There is still an undue and large amount of depression characterising the market for the raw material, and notwithstanding the existence of some very favourable features in the market prices continue to recede in spite of their already low figures. Heavy local consumption, good shipments, and reduced stocks all alike fail to stimulate the speculative demand, and place prices upon a more remunerative level. The tone is dulled, the market depressed, and even in Middlesborough, where the stocks last month was reduced by about 20,000 tons, there is no appearance of vitality, nothing to indicate any speedy return to better times; but the feeling is there still dull, and the prospects considered gloomy.

In makers' iron there is a fair business doing, and quotations all round remain without alteration. The weekly advices received from Glasgow show that at the opening of the present week the warrant market was dull, and prices fairly steady at about 4s. 10d.; but on Tuesday the price declined to 4s. 4d., there being buyers there at the close. On Wednesday there was a large business transacted at 4s. 2½d., to 4s. 1d., but towards the close of the day the market became stronger, and the price improved to 4s. 4d. Yesterday a fair number of transactions were carried through at 4s. 1½d. to 4s. 3½d., and the closing figure this afternoon is 4s. 7½d. The shipments last week were fairly good, amounting to 12,167 tons, against 10,792 tons for the corresponding week of last year, being an increase of 1,375 tons, and which makes the total shipments for the whole of this year 558,789 tons, against 547,809 tons for the similar period of last year, and 497,426 tons for the same time of 1881. There is one furnace less in blast now than a week ago, the total being 104, while the public stock has been reduced by 788 tons, and now amounts to 588,230 tons, against 589,018 tons a week ago.

The imports of Middlesborough pig-iron into Grangemouth last week were 5410 tons, against 4780 tons for the corresponding period of last year, being an increase of 630 tons, and which makes a total increase for the whole of this year compared with last of 24,855 tons. The advices from Middlesborough show that the Cleveland market is very flat, and the prospects unpromising, business in all branches being extremely dull. Makers' nominal quotation for No. 3 is 3s. 3d. to 3s. 6d., but second-hand parcels are freely offered at 3s. 3d. to 3s. 1½d. for present delivery, whilst for forward prompts quotations are still cheaper. There is next to nothing doing in warrants, which are held for 3s. Although No. 4 forge iron is being offered at the very low rate of 3s. 6d., it does not attract buyers. The shipments last week were more than 23,000 tons, and the public stock was reduced by 667 tons, and now amounts to 65,895 tons.

The demand for manufactured dull, and prices are again easier, particularly for forward delivery. The quotation for common bars is 5s. 12s. 6d.; for angles, 5s. 7s. 6d. to 5s. 10s.; and ship-plates, 5s. 17s. 6d. to 6s. per ton. The report from Wolverhampton shows that the tone is scarcely so firm, and new business is much quieter. Tank-plates are quoted at 7s. 12s. 6d. to 8s. 10s., and boiler-plates at 8s. 10s. to 9s. 12s.; sheets are offering at 7s. 11s. 6d. to 8s. 10s. for ordinary singles, and doubles at 8s. 5s. to 8s. 10s. In pigs there is not much doing, all-mine sorts being quoted from 6s. to 6s. 9d., and common Staffordshire at 4s. per ton. A similar report comes from Birmingham, new orders being scarce; but some of the works are fairly well off for work with old specifications. The minimum quotation for marked bars is 7s. 10s., and for the average ordinary qualities 6s. 5s. At the same time, notwithstanding these favourable rates, buyers hold aloof in the hope of being able to purchase at still lower prices later on.

TIN.—Since our last there has been a very weak market for tin, and prices have been daily reduced. If the course of the market this week can be taken as the forerunner of what is likely to occur in the future the prospects are indeed dull and black; but it hardly seems likely that there will be a continuous drop. Fluctuations are almost certain to occur, and efforts will in all probability be made to stay the downward tendency. Some rebound will in all likelihood be made, because there is still a great interest in the maintenance of quotations. The question which requires solution is whether such fluctuations will tend to the permanent good of the trade, or whether they will be merely unsettling the market for a time, and perhaps cause even further reduced rates afterwards. There is nothing in existing features to give support to the market, no unusual demand likely to crop up, no probability of any failing off in supply, no prospect of reduced stocks, and it is evident that there is no confidence whatever in the future of the market.

This is clearly proved by the comparatively low prices for forward prompts, which continue to be quoted at the same rate, or even below those for sharp cash parcels. One satisfactory point in the market is that, whatever may be the future—whether fluctuations occur or steadiness is preserved—there does not seem to be much chance of the figures quoted interfering in any way with the legitimate trade. Deliveries have for a long time past been well maintained, in spite of dear rates, and there is nothing to indicate they are likely to fall off; but it must be remembered that prices are influenced more by the speculative rather than the regular demand, and the former just now is quiet. The Netherlands Trading Company announce a public sale for the 29th inst. at Amsterdam, when 22,100 slabs of Banka and 6700 slabs of Billiton will be offered for disposal.

SPELTER.—Spelter is very firm and in fair demand, and Silesian spelter, on which we must rely for our chief supplies, must be calculated at 16s. per ton c.i.f. London or Hull, as the water route is now not to be depended upon.

LEAD.—Spanish has been done at 11s. 12s. 6d., but is now decidedly steadier with buyers at that price and sellers asking 11s. 15s. per ton.

STEEL.—The demand is very dull and prices are easy.

TIN-PLATES.—Although there is still a very good demand for coke waster, the enquiry of late has slackened off to some slight extent.

QUICKSILVER.—The Board of Trade Returns for October are as follows:—

	1881.	1882.	1883.
Imports—October	Bottles	600	950
January—October	"	47,046	44,728
Exports—October	"	2,032	3,374
January—October	"	19,330	31,780

The exports being again over 4000 bottles are satisfactory, and indicate that the stock is being gradually reduced. Our market is fair, with an entire absence of offers from second-hands, and a good business is doing for export and consumption at 5s. 5s.

The MINING SHARF MARKET has not been either so active or so firm this week, and in the absence of public buyers prices have given way all round, and quotations are nearly all nominal. The mines dealt in have included Great Laxey, New Kitty, Gunnislake (Clitters), Wheal Crebor, West Crebor, Prince of Wales, Devon Great Consols, Bratsberg, Potosi, Chile, and one or two others.

TIN.—Contrary to expectation, tin has been flatter; but no alteration has yet been made in the standards for ore. Tin mines are little dealt in. Blue Hills, ½ to ¾; Carn Brea, 3 to 3½; Cook's Kitchen, 13 to 14; Dolcoath, 60 to 62; East Pool, 39 to 40; East Blue Hills, ½ to ¾; Killifreth, ½ to ¾; New Kitty, 1½ to 1½; North Blue Hills, 1s. 6d. to 2s. 6d.; South Condurrow, 8½ to 9½; South Frances, 7½ to 8½; Tincroft, 6½ to 6½; Tresavean, ½ to ¾; West Basset, 3½ to 4; West Frances, 5 to 6; Wheal Agar, 13 to 13½; Wheal Grenville, 5½ to 6; Wheal Kitty (St. Agnes), 1 to 1½; Wheal Pevor, 3 to 3½; Wheal Uny, 1 to 1½; Wheal

hand of his having shipped some 50 odd tons, which realised something over \$1000. The north-west wind was being rapidly sunk, and is now nearly 100 ft. below the 6th level.

Kohinoor and Donaldson, $\frac{2}{3}$ to $\frac{1}{2}$; the returns for September show that the total proceeds were 970L: 29 tons of smelting ore from the Donaldson averaged \$82.75 per ton, and 39 tons of smelting ore from the Champion averaged \$43.63 per ton. A good quantity of milling ore has been added to the amount already stocked in order to have a good supply on hand for the new mill, the machinery for which is now on the ground.

In Lead Mine Shares there has been no variation worthy of notice, and prices are purely nominal. Great Laxey shares have fallen during the week to 9, 10, owing to the smaller sales of mineral, but yesterday experienced a decided improvement and close 10, 11, with an altogether better feeling.

Tankerville Consols, 4s. to 6s.; the lode in Watson's engine-shaft below the 232 is 3 ft. wide yielding good stones of lead ore, and from the appearance of this lode which is underlying faster towards the main lode a junction of the lode may be shortly expected. The sale of lead ore and blends on Thursday realised 1480L.

Roman Gravels, 6s. to 7; the stopes throughout the mine are yielding ore in quantities equal to average of past six months. The sale of 250 tons of lead ore realised 1745L.

At the Stock and Share Auction and Advance Company's sale on Thursday the prices obtained, among others, were London Necropolis and National Mausoleum 10L shares, 3s.; Mirror Advertising Company 1L founders' shares, 3s. 6d.; South Staffordshire and Birmingham District Steam Trams 10L shares, 5s. paid, 3s.; South London Trams, 8L 12s.; The United Horse Shoe and Nail, Preference shares, 10s. 6d.; Redford shares, 5s. 6d.; Manchester, Bury, &c., Trams, 9L 7s. 6d.

The first week's traffic receipts of the Grand Trunk Railway main line amounted to 81,329L, being an increase of 261L as compared with the heaviest week but one in the whole of last year. The receipts for the concluding eight weeks of 1882 averaged 76,347L.

It is notified that the debenture coupons, due Nov. 11, of the Mauritius Land Credit and Agency Company (Limited) will be paid at Messrs. Barnetts and Co., and at the Royal Bank of Scotland, Edinburgh, and its branches.

The numbers are announced of 187 bonds amounting to 6700L of the National Nitrate Railways Company of Peru. Issue of 850,000L 7 per cent. Second Mortgage Bonds, to be paid off at par, on Dec. 1, at the offices of the International Financial Society, London, or at their agents in Paris, or Brussels.

The Arnoton Coal Company at their meeting in Edinburgh on Wednesday declared a dividend of 10 per cent. as recommended by the directors.

WHEAL JANE.—The committee met at the London office on Monday, and after considering some 16 applications, it was decided to appoint Mr. Everett Hancock as secretary.

CANKIM BAMOO.—A box of alluvial quartz, received in London from the mines, has been analysed by Mr. F. Claudet, and in his certificate, dated Nov. 6, he says.—I have examined the sample of mineral received on Oct. 31, and find the result to be—Black stuff: Insoluble siliceous rock, 91.46 per cent.; oxide of iron, 3.80; carbonaceous matter, 4.40; gold and silver, 0.09; arcoine, 0.06; copper, 0.03; sulphur, none=99.84—that is, gold, 27 ozs. per ton of 20 cwt.; silver, 2 ozs. 5 dwts. per ton of 20 cwt. The insoluble siliceous rock gave—Silica, 66.70; alumina, 23.60; lime, 0.25; magnesia, 0.72=91.27.

THE PANAMA CANAL.—A despatch from Panama (Oct. 26) gives an account of the progress of the work on the Panama Canal. The total length of the canal will be 74 kilometres from the Atlantic to its mouth in the Pacific. It is divided into 12 sections, in which are employed daily 30 steam excavators, 40 locomotives, and 800 tip-wagons. There are 90,000,000 cubic feet to be excavated. The grand cutting, about two-thirds of which has already been excavated, is that between Obispo and Paraíso. The number of men employed upon the works exceeds 10,000, and the excavations up to Oct. 15 amounted to more than 2,500,000 cubic metres. The working force will soon be augmented, and will form a total of 15,000 men.

PATENT STEAM BOILER COMPANY.—This company, which has for many years enjoyed a high reputation for their Root's and other sectional boiler which they have brought to a high state of perfection announce that on Nov. 1 they took into partnership Mr. Howard Lane, who has hitherto acted as their engineer. The business is to be carried on under the same style as in the past.

ENGLISH COAL AND GERMAN MARKETS.—As import and consumption kept balance pretty well prices in 1882 remained, says Consul-General Annesley, of Hamburg, unchanged until August, when a rise occurred on account of the higher English freights, which especially affected gas and small coals, and was sustained with little alteration until the end of the year. The imports of Westphalian coals were especially strengthened in the latter half of 1882 by the development of the iron industry. During the first half this business suffered from over production. The scarcity of wagons still affects this industry. A railway conference, which was held on April 13, 1883, was attended by delegates from the various Chambers of Commerce concerned, and resulted in a reduction of 5 marks per 10,000 kilos, or 6d. per ton, in the railway conveyance cost of such coal as was destined for transmarine export. Although this reduction was gratefully acknowledged, strenuous efforts are and will be made to extend this boon to all coal conveyed to the Northern sea ports, whether destined for export or for firing steamboats, &c. It is felt, and doubtless such a feeling will soon grow into a fact, that until a canal has been constructed, communicating with the colliery districts, English coals cannot be driven out of the market unless freights are reduced to 5 marks per ton for Westphalian coals. Discharging facilities will not be neglected in the new scheme for the free port district. The old prejudice against these coals may now be said to have been completely overcome, and their use is rapidly increasing amongst shipping companies, railway companies, and factories.

VICTORIA UNIVERSITY (OWENS COLLEGE), MANCHESTER.—At the annual meeting of Convocation on Tuesday (Prof. H. E. Roscoe in the chair) the question of conferring degrees upon qualified practitioners formerly students of the medical school was raised. A resolution was submitted expressing the opinion that it is advisable that such practitioners who have been trained in the Manchester medical school should be admitted to medical degrees with as little delay and as few demands upon their time as possible. It was urged that only the professional examination should be exacted, and that the resolution should apply, not only to men who had studied in the medical department of Owens College, but to those who passed through the medical school before it was taken over by the College. Vice-Chancellor Greenwood said he was afraid the supplemental charter of the University charter interposed some difficulties in the way of the proposal, and ultimately an amendment was adopted asking the University Court to consider "whether it may not be possible to afford to registered practitioners who have been trained in the medical department of Owen's College special facilities to meet the requirements for medical degrees."

MINING INSTITUTE OF SCOTLAND.—Previous to the general meeting on Thursday the members made several interesting visits. At the works of the Glasgow City and District Railway the members were admitted to the shafts in Montrose-street, where the tunnelling was in mixed strata; at the Circus, West Nile-street, the tunnelling being on the surface and freestone; in West Regent-street, between Hope-street and Wellington-street, boulder clay; in Blythswood-square, freestone; and in West Regent-street, where Holland-street intersects, boulder clay and freestone. The operations were watched with much interest, the system of timbering, and the substantial brick arching were minutely examined and admired. At the offices of the Tharsis Sulphur and Copper Company, West George-street, the Council and others examined some old mine timbering found in the Tharsis Mines. One of the pieces was supposed to be the framework of the bottom of a shaft, and another the support to a gallery, and they are believed to belong to the time when the Romans worked the mines 2000 years ago. The wood, which was of pine, was very fresh from having been preserved by the sulphate of copper. It was chiefly remarkable for the limited width and breadth of the shaft and lowness of the gallery, and the strong resemblance which it bore, as regards construction, to the Welsh system of timbering. At the general meeting (Mr. Ralph Moore presiding) discussions took place on papers read at former meetings by Mr. Beith, "On Experiments with Forcing and Exhausting Fans," and Mr. Beily "On Young

and Beily's Process for the Treatment of Coal." Papers were also read by Mr. F. J. Rowan "On Gas Firing for Steam Boilers," and by Mr. David Cowan "On the Valuation of Ironworks and Mines."

NEW PATENT ACT.—Mr. W. Wise's summary of this Act has been reprinted from Engineering in pamphlet form, and appears likely to be useful as a guide to inventors and the public generally. Mr. Wise is a good authority upon the subject, and has evidently prepared the pamphlet with the utmost care.

The Society of Arts will commence its 130th session on Nov. 21, when Sir Wm. Siemens, F.R.S., Chairman of Council, will deliver the opening address. The Society has at present between 3000 and 4000 members, and is doing a vast amount of good in the diffusion of useful technical knowledge.

NEW AND ECONOMIC BELTING.—The latest patent in bands used for machinery is one for an invention by which it is claimed that the only good belt made of textile fabric can be produced—it is not affected by change of temperature, stretches very little, is thoroughly waterproof, is tested to be as durable as leather, and being without the objectionable joints and splicings of a leather belt it runs straighter and truer. The belt is made solely of the best Russian flax. In price it is from 25 to 60 per cent. cheaper than leather belting. It is believed to be the only belt made wholly of flax, and there appears to be full justification for the statement of Mr. B. A. Barczinsky, who is introducing it into the London market, that it has many advantages. The unusual strength of the belting results from its being folded somewhat peculiarly, and which is the reason of its stretching remarkably little. It is rendered waterproof by an entirely new process, the canvas before being made up being supplied to the manufacturer from the works of the Russian Government at St. Petersburg, where the process of waterproof is conducted in camera. The peculiarity of this process gives it a marvellous grip of the pulley, and no matter how long the belt is used, this never leaves it. The flax belt has been in use in Russia for more than two years and a half, and it has given the greatest satisfaction. As a matter of fact the belts now ready for sale here are manufactured by machinery turned by belting of the identical description. Cotton belts warp, curl, and require oils and belt syrups to keep them on the pulley. The flax belt never requires any attention of this sort, and works as flat and handsomely at the end of its career as at the beginning, and it neither curls or warps. With all these advantages it is the same price as cotton goods, and yet flax as a marketable commodity is a much more expensive one than cotton. The belting is certainly likely to come into very general use.

CASSELL'S PUBLICATION.—Archdeacon Farrar's Life and Work of St. Paul, part 22, contains the continuation of the narrative of Paul's last journey to Jerusalem, and the chapters on Felix and Paul before Agrippa II. Knight's Dictionary of Mechanics, part 33, extends from Tephne to Turbine.

CASSELL'S ILLUSTRATED ALMANAC.—The new edition for 1884 has just been published, and a more attractive sixpence worth could scarcely be desired. In addition to the usual calendar matter there is a good tale, obituary of eminent persons, household notes, gardeners' calendar, and various other readable information, as well as upwards of a dozen well executed illustrations. The almanac is well entitled to extensive patronage.

EPPS'S COCOA—GRATEFUL AND COMFORTING.—By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame. *Civil Service Gazette.*—Made simple with boiling water or milk. Sold only in packets, labelled "JAMES EPPS and Co., Homeopathic Chemists, London."—Also makers of Epps's Chocolate Essence.

CARN CAMBORNE TIN AND COPPER MINING COMPANY (LIMITED).

CAUTION TO HOLDERS OF SHARES IN THE ABOVE.

Numerous instances have come to our knowledge wherein holders have been deluded into selling their shares in Carn Camborne by seeing fictitious low prices advertised by parties who had no shares for sale.

An instance recently occurred wherein one of these advertisers sold shares at 18s., and when forced to deliver had to pay £2 each to buy them through the Stock Exchange.

We have repeatedly advised buyers to pay only on receipt of transfer duly certified by the secretary of the company, or with certificate attached.

Parties who have sold their shares at the prices advertised complain that they cannot get their money or the shares returned.

The following is a copy of a letter received by us to-day. We suppress the names for obvious reasons. The letter is from a lady:

Marlborough, Oct. 31, 1883.

GENTLEMEN.—Will you kindly inform me whether I have any Carn Camborne shares booked to me. Four months ago a man named * * *, of * * *, bought 10 from me, professing to sell them again he promised to give me 18s. 3d. per share (.), and after signing the usual transfer he sent for my certificate for the 20 shares, promising to send me one in place of the remaining 10. I have written to him again and again but can get no reply, and this afternoon my solicitor advised me to write to you and ask whether the man had not sold the 20 and pocketed the money; at any rate he is not honest, or I should have heard from him long before this time. Will you kindly give me any information you can? This is the third time I have been thoroughly cheated, and it will be the last.

Yours truly, * * *

The foregoing is not an isolated case, for numbers of such have come before us. Timid holders are frightened into selling shares on seeing them quoted far below the price they paid for them.

We have known shares so obtained to be transferred at nearly double the price which the seller received for them, if he has been fortunate enough to obtain it at all.

The prospects of Carn Camborne Mine are steadily improving, and a great rise in the price of shares is certain before long. We are large holders, and not inclined to sell, but advise investors to buy all the shares they can get, but only pay cash on delivery.

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A MINING ENGINEER, who has resided at Collieries in South Wales, and managed Silver-lead Mines abroad for some time is desirous of RE-ENGAGEMENT as MANAGER OF MINES or ASSISTANT MANAGER to a large concern with prospects of good advancement at home or abroad—abroad preferred. Speaks French, and has some knowledge of German and Spanish. Can assay Copper Zinc, Lead, Gold, and Silver. First-class references and testimonials. Address, "L.", care of J. S. Merry, Esq., Mining Offices, Swans.

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NOTICES TO CORRESPONDENTS.

Mining Journal—Late Delivery—"D.G.K." (Jamaica-road) and others.—Owing to the breakage of a machine cylinder, and consequent damage, though slight, to one set of forms when only part of last week's impression had been printed, the delay of nearly an hour was occasioned, and hence many copies were not sent until a later post. As an hour's delay in posting often involves a delay of 12 to 24 hours in the delivery of newspapers the lateness of arrival of which many complain, and which we much regret, is accounted for.

Coal Resources of Queensland.—In his very interesting article, the third part of which appeared in last week's Journal, Mr. Tenison-Woods states that a company is being formed in London to work the coal property of Messrs. J. Callaghan and Co. Will some correspondent kindly furnish the address of the gentlemen by whom the company is at present represented?—P.-D.: *Junior Carlton Club.*

Dixon's Calculator.—"C. G." (Rhodes-y-Cae): No copies have yet been received in this country, and we are not sure that the work is yet issued in New York. Write Messrs. Trübner and Co., or Messrs. Sampson Low and Co., both of London, and either will supply the book as soon as ready. We do not know what the price will be, but American books are always more expensive than English.

Bessie.—"W." (New York): Send draft on London for £35 to cover; B. E. and C. 3L 4s. 6d.; G. C. C., 3L 17s. 2d.—"R. K." (Tone, Nevada): The address has been altered—"A. and Son" (New York): Inserted as desired, commencing last week; account sent by post—"J. N." (Alford): Both are progressing well and it is generally considered that it will well repay to hold, though there may be no improvement just at present—"J. R. M. R.": Answered by post—"J. S. P." (New York): Thanks—"T. C." (West Lydford): The matter shall be considered, and a reply forwarded by post—"J. F.": Attended to.

THE MINING JOURNAL,
Railway and Commercial Gazette.

LONDON, NOVEMBER 10, 1883.

INSTITUTION OF CIVIL ENGINEERS.

Numerous as are the associations in this country for the diffusion of technical and scientific knowledge there is probably none which has played a more important part in assisting the development of those industries which have contributed to make the last half century remarkable as the most progressive in the world's history than the INSTITUTION OF CIVIL ENGINEERS, and in commencing their sixty-sixth session on Tuesday next the Members, Associates, and Graduates may well congratulate themselves upon the continually increasing utility and prosperity of which the Association can boast. The business of the session will be opened by Mr. George B. Bruce giving a brief account of the Northern Pacific Railroad—the opening of which he attended as the representative of the Institution—and among the subjects likely to occupy the early attention of the members are:—"The Adoption of Standard Forms of Test-Pieces for Bars and Plates." By William Hackney, B.Sc., Assoc. M. Inst. C.E. "The New Eddystone Lighthouse." By W. T. Douglass, Assoc. M. Inst. C.E., and "On Electrical Conductors." By W. H. Preece, F.R.S., M. Inst. C.E. In addition to this the educational lectures which gave so much satisfaction to all who have the privilege of attending them last session will be continued this, and it may even be anticipated that the coming series, treating of Heat in its Mechanical Application, will prove of even greater general interest than the series of Electricity given last year. The delivery of these lectures will extend from the present time until April next, and during the course the General Theory of Thermodynamics, by Prof. Osborne Reynolds, F.R.S.; the Generation of Steam, and the Thermodynamic Problems Involved, by Mr. W. Anderson, M. Inst. C.E.; the Steam-engine, by Mr. E. A. Cowper, M. Inst. C.E.; Gas and Caloric Engines, by Prof. Fleeming Jenkin, F.R.S.S. L. and E., M. Inst. C.E.; Compressed-Air and other Refrigerating Machinery, by Mr. A. C. Kirk, M. Inst. C.E., and Heat-Action of Explosives, by Capt. Andrew Noble, F.R.S., M. Inst. C.E. Members, Associates, and Students have the right of personal admission and every Corporate Member can introduce one friend.

I need scarcely be remarked that the vitality of an Institution such as that now under consideration is usually measurable by the readiness with which individual members make known to their colleagues the discoveries which they have made, and the information they have gained in the course of their practical experience, so that the secretary—Mr. JAMES FORREST—is fully justified in saying, in his circular to the members, that as mechanical science, which it is the object of the Institution to promote and advance, particularly in its application to civil engineering, is expanding every day, the members should evince their appreciation of this fact by contributing such original communications, for reading and discussion at the ordinary meetings, as will lead to the Institution of Civil Engineers maintaining its ground as the representative body of the profession. As indicative of some of the topics likely to receive consideration, attention is directed to a number of subjects, the discussion of which could usefully be opened by well considered papers. Amongst these are—1. The comparison of the decimal and duodecimal systems of measurement for engineering purpose.—2. Improvements in instruments for surveying and levelling.—3. The strength and stiffness of long struts.—4. The strength of pin-joints.—5. The various systems of brick-making by machinery.—6. The qualities of metal for various purposes.—7. Iron foundry practice as regards melting, with the results obtained from various forms of cupola, pressures of blast, &c.—8. Brass foundry practice, furnace, melting mixtures, &c.—9. Improved methods of moulding with precision, especially by machinery.—10. The effect produced on the mechanical and other properties of steel by tempering in oil and in water.—11. Gaseous fuel, and its influence on smoke abatement.—12. The constitution and destructive distillation of coal, and the residual products of gas-making.—13. The type of steam-engine best adapted for ordinary factory purposes, in respect of economy in first cost and in cost of working and maintenance.—14. Railway construction in the United States and in Canada.—15. The application of the compound principle to locomotive engines.—16. A record of locomotive performances as regards weight, power, consumption, and dynamometer returns.—17. On measures for improving the efficiency of railways.—18. Mechanical power on tramways, including steam, compressed air, electricity, cables, &c.—19. The works carried out on the continent of Europe and in North America for the improvement of rivers, and of inland navigation generally.—20. Maritime canals and ship railways.—21. The comparative cost of transport by land and by water.—22. The stability of ships.—23. The present state of marine engineering.—24. Vessels for inland navigation, with the mode of working them by sternwheels, propellers, &c.—25. The manufacture of steel-faced armour-plates.—26. The sewerage of towns on the separate system.—27. The methods and appliances for blasting rock under water.—28. The comparative merits of water and of compressed air in driving tunnels under estuaries and through mountains.—29. The transportation, storage, and shipment of grain.—30. Improvements in the mechanical engineering of collieries.—31. The methods employed in securing large and irregular-shaped mineral workings; for example, the Almaden Mines, the Great Comstock lode, &c.—32. Gold-quartz stamping and amalgamating appliances.—33. The manufacture of lead and the extraction of silver.—34. The methods and machinery employed for separating the impurities from coal, as carried out in South Wales in connection with the manufacture of coke for the iron and steel trades.—35. Large-bore naval and coast-battery ordnance, and the form of projectile best adapted for range, penetrative power, and general useful effect.—36. On electrical conductors.—37. Electro-motors: their construction, efficiency, and power.—38. On gearing for dynamo-machine motors, and other high-speed machines.—39. The transmission and distribution of electricity over large areas for lighting and for motive power, including electric railways, hoists, &c.—40. Electrical measuring instruments.—41. Submarine telegraph cables, their manufacture, laying, and repair, including deep-sea sounding methods and appliances.—42. Telepheras or the automatic electrical transport of goods and passengers.—43. The measurement of work by dynamometers, with descriptions of the apparatus.

Apart from the advantage derivable by the reader of a paper from comparing notes with others who have had, perhaps, greater experience than himself in the same direction, it cannot be doubted that to be the author of a laudated paper at once gives him a rank in the profession which might require years to attain in any other way. In this respect the Institution of Civil Engineers are particularly well provided with premiums, prizes, and other recognitions of considerable value, whether regarded as honours or for their intrinsic worth. For original communications upon the subjects just named the Council will award various premiums arising out of special funds bequeathed for the purpose, such as the Telford fund, with accumulations of dividends, produces 260*l.* per annum, the Manby donation of the value of about 10*l.* a year, given to form a fund for an annual premium or premiums for papers read at the meetings; the Miller Fund, bequeathed by the testator "for the purpose of forming a fund for providing premiums or prizes for the students of the said institution, upon the principle of the 'Telford Fund.'" This fund (with accumulations of dividends) realises 150*l.* per annum. Out of this fund the Council have established a scholarship—called "The Miller Scholarship of the Institution of Civil Engineers"—and are prepared to award one such scholarship, not exceeding 40*l.* in value each year, and tenable for three years. In addition to these there is the Howard bequest of about 16*l.* per annum for presenting periodically (the next presentation will be in 1887) a prize or medal to the author, being a member of the Institution, of a treatise on any of the uses or properties of iron, or to the invention of some new or valuable process relating thereto. The Council will not make any award unless a communication of adequate merit is received; but will give more than one premium if there are several deserving memoirs on the same subject. In the adjudication of the premiums no distinction will be made between essays received from anyone connected with the Institution (except in the cases of the Miller and Howard bequests, which are limited by the donors), or from any other person, whether a native or a foreigner.

Nor are the Council and Members of the Institution of Civil Engineers at all jealous of similar societies—all that is intended to promote the welfare of the profession willingly aid to their utmost. The council have again granted the free use of the rooms of the institution for the meetings of other societies dealing with branches of engineering, as under:—The Mechanical Engineers (founded in 1847) on two days in January and two days in May; the Meteorological Society (1850) on the third Wednesday in each month; the Gas Institute (1863) on three days in June; the Iron and Steel Institute (1869) on three days in April; and the Telegraph Engineers (1871) on the second and fourth Thursdays in each month. By the courtesy of the respective societies, all the members of the Institution of Civil Engineers are invited to attend on these occasions; so that a member of the institution has really greater advantages than the member of any other. It is not too much to say that the prosperity and importance of the Institution of Civil Engineers is in a great measure due to its liberality and the excellence of its management, and that these have secured the good wishes and respect of every enlightened man in the kingdom.

PROPOSED MINING AND SCIENCE COLLEGE FOR
SOUTH WALES.

The people of South Wales are to be congratulated upon the success which has attended their efforts to get Government recognition of their claims to higher education. For many years successive Governments turned a cold shoulder to their frequent appeals for help, and refused to recognise the justice of any demands made upon the national purse for the better education of the inhabitants of the Principality. It is a long lane, however, which has no turning; and the truth of this proverb has been verified in the case of Wales. Last year the Government sanctioned a grant of 400*l.* a year each to South and North Wales for educational purposes, and this subsidy, small though it be, so stimulated the residents and friends of the Principality, that already the College for South Wales has been opened in Cardiff with about 100 students, and the College for North Wales is in a very forward state, and will be formally opened in the course of a few days. This, so far as it goes, is a decided step in the right direction, and the general higher education of the people of the Principality will undoubtedly receive a much wanted stimulus, which will be productive of the greatest good.

It would, however, be idle to attempt to deny the fact that Swansea and the whole of the western part of South Wales feel sorely disappointed at not having the college established nearer the centre of the coal basin and the great metallurgical and other industries of the district. Nor will any but the most zealous partisan of the Cardiff College contend that that establishment will supply adequate facilities for the mining and scientific education of the people. One of the first essentials to a successful mining and scientific college is, that it should be situated within easy reach of colliery operations and metallurgical manufactures, so that the pupils may have practical lessons at the works for the study of their various departments. Cardiff is far too remote from the centre of large works to afford such valuable advantages, and, therefore, a pretty general opinion prevails that the present is a most opportune moment for establishing a Mining and Scientific College at Swansea for South Wales. The Swansea Grammar School is a most valuable educational establishment, having a large and increasing endowment fund in the shape of mineral rents, and the suggestion is that the proposed Mining and Scientific College should be an annex to the Grammar School, a proposition which, if carried to a successful issue, would be most advantageous to all parties.

That South Wales urgently requires such means for the technical education of her sons cannot be doubted for one moment. With the single exception of the Clyde basin the South Wales coal basin is the largest in Great Britain, spreading over some 900 square miles in the counties of Glamorgan, Carmarthen, Pembroke, and Monmouth. The Royal Commission which investigated its extent and workable area some 10 or 12 years ago, reported that it contained, within 4000 ft. of the surface, no less than 31,783,000,000 tons, and taking a fair average working consumption, it would last some 2300 years. By far the richest portion of this deposit lies to the westward, and includes part of the celebrated Rhondda and Afan Valleys. There are about 550 collieries within about 40 miles of the port, exporting about 1,000,000 tons annually; whilst the patent fuel works turn out about 200,000 tons. So much, then, for the coal measures. With regard to the metal manufactures and other staple industries, Sir HUSSEY VIVIAN, M.P., recently stated that "Swansea was the centre of the metal trades of the kingdom," and he had ample grounds to justify this remark. Within about 20 miles of the town there are about 40 ironworks, and several of the largest steelworks in the kingdom. Within a radius of three miles of the Swansea post-office there are about 40 tin-plate mills capable of turning out some million boxes annually. Swansea has, from time immemorial, been regarded as the chief seat of the copper trade in the kingdom; the words of Prof. PHILLIPS that, "of the entire mass of copper in Great Britain, fully nine-tenths are smelted in the Swansea district," still holding good. Swansea has also extensive zinc-works, silver-works, nickel-works, cobalt-works, chemical-works, &c.; in fact, metal and mineral works of almost every description are established within a few miles of Swansea, employing thousands of hands, and spending an annual capital exceeded by but few manufacturing districts in the kingdom.

We have mentioned these facts simply to show how necessary and how valuable a Mining and Scientific College would be for South Wales generally, but Swansea particularly, and what advantages and facilities exist for the success of such an institution. There is now nothing worthy of the name throughout the whole South Wales district, and the result is that consequent upon the absence of this technical and scientific teaching, many of the most lucrative offices in the works are held by German and continental professors. Several of the principal merchants and manufacturers of Swansea recently offered very large sums in support of the South Wales College if located in their midst; but Cardiff having now been selected as the site of that establishment, they have not felt called upon to remit their promised contributions. It is felt that if a Mining and Scientific College was established in connection with the Swansea Grammar School they would gladly forward to such institution their promised

subscription. The great metal manufacturers of the district would also undoubtedly liberally contribute to such an excellent movement, seeing how beneficial it would prove to the best interests of their own works. The present, therefore, is most opportune time for a determined effort to be made now that a general feeling in favour of advanced education pervades all classes. The movement, as it appears to us, possesses every element of success, and we make these remarks on behalf of the great mining and manufacturing industries of South Wales in the hope they will stimulate the exertions of the promoters of the movement, and lead to success in the not distant future.

THE CONSUMPTION OF AIR IN MINES.

It would appear that no rule has been laid down as to the quantity of air necessary for ventilating mines of different capacities, consequently sometimes as much air is sent into a mine employing 200 persons as there is into one in which twice that number are constantly engaged. Yet in a scientifically ventilated mine a certain amount of air should be allowed for each person working underground as well as for each light and horse, and also for various other purposes. In some mines, of course, more air will be required than in others, for in those where there is no escape of fire-damp and little or of any other mineral gas, about 120 ft. per minute for each man and boy may be taken as the minimum quantity for sanitary purposes alone; but where there was gas given off in considerable quantities nearly twice that quantity should be allowed. An eminent authority in the evidence given by him before a Select Committee, on being asked as to what quantity of air he would be satisfied with in the pits under his management, replied that much would depend upon the requirements of each. In a mine which yielded no fire-damp, with 120 or 130 persons in it, he should require from 200 to 230 ft. for each person, if properly conveyed up to the face of the workings, and made to sweep those districts where the people were employed; but in a fiery mine he should require very much more than the quantity named. Now, as one of the mines where an explosion took place recently employed nearly 400 persons during the day, it will be seen what a vast quantity of air is necessary to render such a place thoroughly ventilated. To effect this one simple regulation should be unremittingly carried out by the officials—no person should be allowed to work in a stagnant atmosphere, whilst the working places and goaves which are the reservoirs of all the deleterious gases brought along by the air-current, should have a plentiful supply of air sent through them into every part, so as to dilute them and deprive them of their power.

But in calculating the quantity of air that should be sent into a mine, there are several other things that have to be taken into consideration besides the mere breathing of the workers and the consumption of oxygen by the lights. For instance, in all excavations in which the air is renewed, and in the galleries of mines in particular, carbonic acid gas is continually found, in quantity more or less considerable. According to circumstances, therefore, it is necessary that the ventilation should be sufficient to draw it constantly away, and to keep that quantity, which is mixed with the air in all parts of the workings beneath that limit beyond which it would become injurious to the health of the workmen. In fact, the displacing of the carbonic acid gas requires a good deal of fresh air, whilst the diluting of the nitrogen requires a great deal more. Mr. RICHARDSON, who paid a great deal of attention to the subject, estimated that the quantity of air required for vital chemical purposes was upwards of 1000 cubic feet per hour. Of this 84 cubic feet was for the breathing of each person, 62 for displacing carbonic acid, 258 for diluting nitrogen, and 270 for displacing perspiration. In addition, however, 59.3 ft. should be allowed for the combustion of each light, and 517.0 for one-fifth of that needed for a horse.

This is not looked upon as an extravagant estimate, for it has been held by some that it does not quite provide for diluting the gases to a point where they would be no longer injurious, nor for renewing the air after it has been breathed, especially when a number of men are working at a continuous face of rock. The slow diffusion of the gases, too, should also be considered, and the varieties of impurities, and the knowledge that hard work is going on in a room of the lowest possible height. By some modes of ventilation there are contrivances for enabling men to breathe over and over again the same air, and so accumulate nuisances—and this is the case more especially in mines which do not give off gas. But such things should not be tolerated at the present time in any district. But in mines giving off gases in large or small quantities there is now no difficulty in providing air in sufficient quantities as to dilute them and render them harmless. But, as we have before stated, the quantities of air sent into most of our mines is forced through the workings indiscriminately and without calculating the number of persons that have to be supplied with it. But in this notice we have endeavoured to give an approximate idea of what should be provided for different purposes, and according to the number of persons employed. Where the furnace is the system of ventilation adopted, it has been calculated that the cost of ventilating the most difficult mines, and where there is a large escape of gas, need not exceed a penny per day per man; and in mines where little or no gas was given off it would not be half so much. The fan, however, is fast superseding the furnace, and the cost by that system should certainly not be so great, although, of course, the first outlay is heavy. The air in a mine can also be largely increased by judiciously splitting or dividing the currents whilst by having several splits the air is brought much purer and cooler to the miners.

THE MINES REGULATION ACT.

Great as are the opportunities which the majority of the readers of the *Mining Journal* affected by the Mines Regulation Acts have of acquiring an intimate knowledge of their provisions, and of their duties and responsibilities under them, there are many points upon which differences of opinion will exist as to the exact interpretation which would be upheld by the Courts, so that a systematic reference to the decisions which have been given upon a special branch of the Acts will be of general interest. The question of offences under the Acts has been discussed (though by a very loose and careless writer, who infers that the cases of *STOKES v. MELLOR* and *FRECHEVILLE v. LOUDEN* were guided by the same Act of Parliament) in the last number of the *Justice of the Peace*, and whilst the article contains many details which are worthy of consideration it will certainly be admitted by all legal authorities that the plea of reliance upon such *dicta* would amply explain the serio-comic decisions which the "great unpaid" sometimes give. The article refers to the *Mines Act (sic)*, and it is inferred in the first paragraph that it is 36-37 Vic. c. 76 that is intended; indeed, no other Act is mentioned throughout; yet near the end of the said article the writer has tumbled into another Act without knowing it—sec. 23 of cap. 77, and not of cap. 76, being that to which he ought to have referred. Such little inaccuracies are, of course, excusable among civilians; but in a legal article intended for legal (?) readers such misdirection is calculated to cause unnecessary inconvenience to both plaintiffs and defendants, who may be unfortunate enough to take the J.P. as their counsellor and guide. Apart from the inaccuracies, however, the article contains much that is useful to be known, though some of the cases cited are so old that they are almost forgotten by practical men.

The owner as defined by the Coal Mines Regulation Act is so well understood that the definition need not be repeated; but it is not always so easy to determine the respective actions which bring a man within the category of agent or of manager. In the well-known case of *STOKES v. MELLOR*, the latter was managing director of a limited company in London working a colliery in Warwickshire, and had corresponded with the Inspector as to the appointment of a new manager; inflammable gas was found in the pit, and no competent fire-trier. The justices held that *MELLOR* was not an agent within the meaning of the statute; but the Queen's Bench Division held that he was an agent and liable. In the case of *EVANS v. MOSTYN* the Inspector laid an information against *MOSTYN*, the lord of the manor of Mold, for leaving a shaft of a mine in the manor unfenced, and in a dangerous state and condition. The lord

of the manor was owner in fee, and was entitled to the surface rights incidental to working and getting the materials. He had demised the mines to a company for 21 years, and the company were in possession, though not working the mine. The shaft in question was close to a turnpike road. The Common Pleas Division, on appeal, held that MOSTYN, the landlord, was liable to fence the shaft. In WYNNE v. FORESTER the question as to who was liable for the ventilation of the mine was involved. The respondent FORESTER, as agent, and HOLLINS, as manager, were summoned for not causing an adequate amount of ventilation. The Inspector in October, 1878, had visited the mine and found the ventilation deficient, the defect being caused by a fall in the roof of the mine. He gave directions to FORESTER to have the same remedied, but nothing was done. The agent acted twice weekly in the absence of the manager. The Justices convicted the manager, but dismissed the case against the agent. The High Court held that the agent ought to have been convicted also. Mr. Justice LINDLEY said the 51st section made it an offence in the owner, agent, and manager if there has been an infringement of the general rules by some other person. That seemed *prima facie* to be unjust, but the Legislature relented by saying that if they can show that they have taken means to the best of their power to enforce the rules they shall not be liable.

In connection with the construction of the Special Rules the case of HAYWOOD v. BAKER is interesting. HAYWOOD had been convicted of having, in his capacity of engine-man, neglected to observe one of the general rules. The rule was to the effect that the engine tender shall not allow any person to be in the engine-house for any purpose, and shall not leave his engine without the authority of the owner, agent, manager, or colliery engineer. It appeared that while men were in the mine below, and the appellant HAYWOOD was the engine-man, a boy named SHORE was in the engine-room oiling the engine, and when so engaged he was caught by the fly-wheel and killed. The colliery engineer had given permission to SHORE to oil the engine. HAYWOOD was convicted and appealed to Quarter Sessions, and the conviction was quashed on the ground that the colliery engineer had power to give SHORE authority to be in the engine-house. A case being stated the High Court reversed the Quarter Sessions, holding that the engineman was not allowed a third person to enter for any purpose. In HIGHAM v. WRIGHT, WRIGHT was summoned for violating a special rule which forbade any coal-miner to go up or down into the pit contrary to the direction of the banksman or hooker-on. WRIGHT, being summoned, contended that the refusal of the hooker-on was an illegal act, for that he, WRIGHT, was entitled by the contract at any moment to discharge himself. The Justices dismissed the summons; but the High Court held that WRIGHT had not ceased to be a person employed in the mine, and was bound by the rules to have the hooker-on's sanction. He ought, therefore, to have been convicted.

The case of FRECHEVILLE v. LOUDEN, though somewhat similar, comes under the companion Act. The Inspector summoned LOUDEN and other miners for riding in a skip without a sufficient cover overhead when being raised in a working shaft of the mine. In order to make this offence intelligible it is to be borne in mind that sec. 23 of the Metalliferous Mines Regulation Act embodies general rules nearly similar to those in sec. 51 of the Coal Mines Regulation Act. One day the man-engine was at work, and the skip was at the bottom of the shaft, also at work, and the miners gave the signal and ascended in the skip, which was dangerous, having no cover. The justices refused to convict, being of opinion that the section did not apply to the miners, but only to the agents of the mine; the High Court, however, said that it was a mistake to suppose that the miners were not equally liable with the agent in neglecting the direction of the statute, and so the case was remitted that the men might be fined.

TREATMENT OF CUPRIFEROUS ORES OF THE PRECIOUS METALS.

In an exhaustive report upon the Stella Mines belonging to the Isabelle Gold and Silver Mining Company Mr. C. H. Aaron give some interesting details with regard to the treatment of cupriferous ores of the precious metals. The ores carry gold, silver, and copper in enargite, the assays showing from \$3 to \$12 gold, and from \$15 to \$71 silver, all being rich in copper, and Mr. Aaron says—In a mine of this character the ore is almost necessarily taken out in the very act of discovery; it must be followed through all its irregularities and ramifications. Hence it is not possible to estimate the quantity of ore which can be certainly got. None is blocked out in advance by means of levels, winzes, &c. I regard as favourable indications—the evident continuity of the chute which may extend to any depth, the re-discovery of the characteristic "diamonds" in the new ore body, the presence of crystalline quartz which I had not observed above, the presence of pyritous quartz porphyry in large quantity, the seam of ore-bearing clay to the westward of the chute, which is by some regarded as the footwall of a fissure vein, which however I should not at present like to affirm. In conclusion, you have in sight on the lower level something which if found near the surface of the ground in a new place would be looked upon as a very good prospect, worth a large sum of money. No sane person would dream of abandoning such a prospect, the value of which is enhanced by the past record of the mine. The chute should therefore be followed. For the present this can be done without great inconvenience from the 220 ft. level, but in order to work to the best advantage, and to properly test the value of the mine, the hoisting shaft should be sunk at least 100 ft., when if the chute continues its present course the distance to be drifted in order to reach it will be small. There is some hope that the clay seam may develop a body of good ore, possibly a true vein. This would also be ascertained by sinking the shaft, which would reach the seam within the depth named if the seam is continuous.

In the reduction works they use Stewart's modification of the Hunt and Douglas. The process is quite suitable for the ore. The original Hunt and Douglas process consisted in treating an (artificially or naturally) oxidised ore of copper with a hot solution of proto-chloride of iron, by which the oxide of copper was converted into proto and di-chloride of copper, with simultaneous formation of hydrated sesquioxide of iron. Salt was added to the bath to dissolve the di-chloride of copper, which is not soluble in water. The solution of copper thus obtained was passed over, or allowed to stand on a quantity of metallic (scrap) iron. The copper was thus precipitated, being replaced in the solution by the iron. The thus regenerated solution of proto-chloride of iron was again used on a fresh quantity of ore, and so on continually.

The advantage of this over earlier processes, in which the ore was treated with dilute sulphuric or hydrochloric acid, or with a solution of per-chloride of iron, or again by roasting sulphurous ores to sulphates or chloride, consisted in the lesser consumption of iron for the precipitation. This was due to the fact that a large proportion of the dissolved copper was in the form of di-chloride, from which a given quantity of iron will throw down twice as much copper as from the proto-chloride or from the sulphate. Silver was regarded as merely incidental, and was to be chlorodised in the roasting of the ore or by the action of the copper chlorides produced in the process. The chloride of silver was to be dissolved together with the copper, and precipitated in metallic state by means of plates of copper (or cement copper) before the precipitation of copper by iron. When an ore contains a considerable proportion of silver the solution of the whole of it is not convenient on account of the large quantity of bath required. Gold, if present, is not dissolved in this process, but remains metallic all through it.

Stewart's modification consists in so managing the bath as to dissolve as much as possible of the copper with as little as possible of the silver, and thus obtaining the latter together with the gold by amalgamation. Without amalgamation the gold would be lost unless indeed some other process such as Plattner's were applied. In roasting the ore in such a manner as to chloridise the silver a portion of the copper is inevitably converted into oxide which without a solvent would be lost.

In this process the solvent is proto-chloride of iron. The obtaining of the silver and copper in mixed solution is the weak point in the Hunt and Douglas process and cannot be entirely avoided in that

of Stewart. This led Hunt to devise a much better process, based on Wöhler's discovery that sulphurous acid decomposes a solution of proto-chloride of copper, forming di-chloride of copper and free acid. Hunt has so modified this as to dissolve the copper, nickel, and cobalt from an ore leaving the gold and silver to be afterwards extracted, by amalgamation or otherwise. The whole of the copper is got as di-chloride, thus reducing the consumption of iron to the minimum. It has been suggested by some that there is no essential difference between the Hunt and Douglas and the well-known Augustin process. This is an error. The Hunt and Douglas is essentially a copper process, in which proto-chloride of iron is indispensable. The Augustin process is a silver process in which iron is carefully removed from the bath expressly to avoid dissolving the oxide of copper from the roasted matte.

SCOTCH PIG-IRON WARRANT MARKET.

Mr. W. WILSON (Glasgow, Nov. 8) writes:—The warrant market has been quiet throughout the week, and the price steady. There continues to be a marked absence of speculative enterprise—so much so, that favourable circumstances, such as a reduction of production in Scotland, and a considerable decrease of stocks in Middlesborough, have not even arrested the downward course of prices. Shipments for the week again compare favourably. A furnace has been put out at Muirkirk, reducing the number blowing to 104. 600 tons were taken out of store here last week, and 1032 tons at Middlesborough. Business was done during the past week at the following prompt cash prices:

	Thursday, Nov. 1.	Friday, Nov. 2.	Monday, Nov. 5.
44/9½, 44/8, 44/11½	... 44/8, 44/11½, 44/10½	... 44/11½, 44/10	
Tuesday, Nov. 6.	Wednesday, Nov. 7.	Thursday, Nov. 8.	
44/9, 44/1½	... 44/½, 44/1½, 44/4½	... 44/5, 44/1½, 44/3½	
	1882	1881	1880
Price of Scotch Warrants, Nov. 5 ...	44/10½	49/6	49/11 ... 51/6
Furnaces in blast in Scotland do ...	105	114	106 ... 119
Iron in store at this date	558,264	618,644	610,781 ... 477,321
Shipments of Scotch pig-iron for week ending Nov. 3	12,167	10,792	11,333 ... 12,430
Do, since beginning of year	558,789	547,809	497,428 ... 591,608
Price of Middlesbrough, No. 3, Nov. 5.	38/1½	41/	41/3 ... 39/9
Furnaces in blast in Middlesbrough dist.	118	121	118 ... 118
Middlesbrough Iron Imported at Grangemouth, week ending Nov. 3	5,410	4,780	9,545 ... 4,253
Do, do, since beginning of year	229,533	204,680	258,664 ... 218,881

BOARD OF TRADE RETURNS.

The Board of Trade Returns for October and the 10 months ended October, show slight improvement. The imports have again increased, and the export account has a trifling balance on the right side. There is, says the Times, an increase, however, not only upon the figures of October, 1882, but also upon the export returns for the month of September in the present year, so that the bottom in the depression of our trade would appear to have been reached. The total declared value of the imports for the month is 35,833,755/-, as compared with 34,152,015/- last year, an increase of 1,681,740/-, or about 5 per cent., and the total for the 10 months is 355,128,514/-, being an increase of 13,598,522/-, or nearly 4 per cent., as compared with the same period last year. The declared value of the exports for the month is 21,138,859/-, against 20,877,713/- in 1882, being an increase of 261,146/-, or 1-2 per cent., but a decrease of 102,222/-, or nearly ½ per cent., as compared with 1881. For the 10 months the value of the exports is stated to be 200,803,944/-, against 203,012,657/-, a decrease of 2,208,713/-, or little over 1 per cent., as compared with the corresponding period of 1881; however, there is an increase of 4 per cent.

With regard to the iron and steel trade, it is to be regretted that it does not participate in the improvement. For the month the exports of iron and steel amounted to 2,477,544/-, against 2,910,876/- last year, or a decrease of 14-8 per cent., and the decrease in quantity is 57,200 tons, or 13-8 per cent. For the ten months the decrease in the total value of the iron and steel exports is 9 per cent., and in quantity 305,059 tons, or under 7 per cent. As compared with the corresponding period of 1881, however, there is an increase of 1,333,131/-, or 5-8 per cent. in value, and of 214,066 tons, or 6-6 per cent. in quantity. The decline for the month is 18 per cent. in pig-iron, 23-4 per cent. in bar and angle iron, 33-6 per cent. in railroad iron, 30-9 per cent. in iron wire, 0-4 per cent. in cast and wrought iron, 4 per cent. in hoop and sheet iron, 30 per cent. in old iron, and 11-6 per cent. in unwrought steel. The only item of increase is in telegraphic wire, but that shows an improvement of only 2 per cent. For the 10 months the percentage of decrease under most of the above heads is not quite so large, except in the case of old iron and unwrought steel, the former having declined nearly 50 per cent., and the latter 32-3 per cent. Cast and wrought iron, on the other hand, shows a fractional increase for the longer period. The total quantity of steel and iron exported for the month is 356,487 tons, against 413,637 tons last year, or a decline of 13-8 per cent.; while for the 10 months the total exports declined 305,059 tons, or about 8 per cent.; but, as compared with 1881, there is a small increase. The principal falling off in pig-iron has been with the United States and France; and in railroad iron to the United States (the decrease for the month being 17,951 tons, or 75 per cent., Spain, and Australia. There has been an increased trade in rails, however, with British East India, and Sweden and Norway; and America has also been a better customer for tin-plates and sheet-iron. The following are the figures:—

	October.	Ten Months.
IRON.	1882.	1883.
Pig and puddled	£470,299	£335,192
Bar, angle, &c.	221,890	169,424
Railroad	677,380	448,698
Wire	110,577	75,815
Telegraphic wire	43,154	44,281
Cast and wrought	411,710	409,461
Hoops, sheets, &c.	382,562	365,632
Iron	29,387	27,545
Steel, unwrought	136,505	120,261
		1,765,760
		1,193,119

The figures relating to our copper exports show an increase of 24,718/-, or 7-5 per cent., having thus rather more than recovered the falling off in August. The increase is in wrought or manufactured copper and mixed yellow metal sheathing, which have improved 11-2 per cent. and 18-8 per cent. respectively. India has again increased her demand for the manufactured article, and is accountable for the increase, as well as for that in mixed or yellow metal sheathing. Unwrought copper fell off 19 per cent., owing chiefly to the less demand from France, and in brass goods there is a decline of about 16 per cent. The totals are as follow:—

	October.	Ten Months.
COPPER AND BRASS	1882.	1883.
Unwrought copper	£109,582	£98,825
Wrought, &c.	111,586	134,424
Brass	43,354	36,162
Mixed or yellow metal sheathing	95,929	113,566
		976,067
		£199,483

Among the miscellaneous articles appertaining to the Midland district, the most noticeable items of increase are alkali 7-8 per cent., small arms 48 per cent., ammunition, 129 per cent., railway carriages 52 per cent., railway trucks 42-5 per cent., coals 5-3 per cent., cordage and twine nearly 16 per cent., machinery 5-3 per cent., steam-engines nearly 24 per cent., ribbons 35-6 per cent., salt 3 per cent., and soap a little over 19 per cent.

TIN TABLES.—Although involving only the application of ordinary compound multiplication, the performance of the calculation necessary to ascertain the value, for example, of 7 tons 13 cwt. 3 qrs. 19 lbs. of black tin at 29/- 17s. 6d. per ton presents to many almost insuperable difficulties; not only is the process itself long and irksome, but the operator is by no means certain of the accuracy of the result when it has been obtained. The calculation of the price of tin ore at a given standard and produce presents similar obstacles. Appreciating the importance of enabling every seller to calculate for himself, and thus be satisfied that he is receiving the agreed price for his mineral, the late Mr. R. Wellington, whose name was well known to the readers of the *Mining Journal*, prepared two useful little ready reckoning—the one showing at a glance the value per ton of black tin of a given standard and produce, the other the value of a parcel of tin ore up to 10 tons in weight at any price

from 20/- to 90/- per ton. These books, which have long been out of print, and were sold at 7s. 6d. each, have now been revised, extended as regards the second table to 100/- per ton, and bound into one volume, reprinted by Mr. W. Bailey, of Camborne, and will be forwarded from the *Mining Journal* Office on receipt of remittance of 7s. 6d. To show the applications of the tables let it be supposed that it is required to know the value of ore of 11½ produce at 54s. 6d. standard, it is simply necessary to refer to the first table, and turning to the heading 11½ produce carry the eye down the column until the amount 54s. 6d. in the standard column is reached, opposite to which will be found 30/- 19s. 11d., the value sought. In the same way, to ascertain the value of the parcel of black tin first mentioned, it is simply necessary to turn first to the page headed 29/-, and then to that headed 17s. 6d., and add the several lines together, thus:—

In 29/- page	7 tons	£203 0 0
	13 cwt.	18 17 0
	3 qrs.	1 1 9
	19 lbs.	0 4 11
In 17s. 6d. page	7 tons	6 2 6
	13 cwt.	0 11 4
	3 qrs.	0 0 7
	19 lbs.	0 0 1

the sum of which is 229/- 18s. 4d., which is as accurate as need be desired. To miners, tributaries, and all having anything to do with the buying and selling of tin ores the tables will prove a great boon; they are well and carefully printed, and appear to be thoroughly reliable.

THREATENED STRIKE OF MINERS.—During the last few days the miners in the West Riding have given notice for a 15 per cent. advance, and that the existing contracts terminate in a month; but there is a strong feeling that when the critical moment arrives some means will be adopted to back out of the strike itself. The colliery owners appear determined not to make any concession whatever, seeing that the present state of trade will not

Gatt. The production of zinc ore has greatly diminished in our province; there are a few cargoes made per year, and shipped to Belgium. The shipments of copper ore are not of importance, but what is shipped goes to the English markets. Salt, of a very excellent quality, is produced in the salt pits at Cape de Gatt, and is shipped to France chiefly.

MANUFACTURE OF ALUMINIUM.

The interesting communication to the London section of the Society of Chemical Industry by its President—Mr. Walter Weldon, F.R.S.—demonstrating the impracticability of reducing alumina by carbon, and the absence of novelty in the so-called Webster process, has been reprinted in pamphlet form, and contains an account of the only process which has hitherto proved successful for the manufacture of that metal, which will be generally acceptable to readers of the *Mining Journal*. On one part of the subject, says Mr. Weldon, I can speak with a little special knowledge; since apart from whatever, if anything, Mr. Webster may be doing in the matter the only manufacturer of aluminium in the world, so far as he or I can learn, is my very good friend Mr. Pechiney, of Salindres; while it so happens that I am the only Englishman who is in the habit of frequently visiting Mr. Pechiney's works, and seeing the various processes which are carried on in them. The process by which aluminium is manufactured at Salindres is the classical process which was worked out more than a quarter of a century since, under the auspices, and I believe mainly at the expense, of the late Emperor Napoleon III., by that most distinguished physicist and chemist the late Henri St. Claire Deville. That process consists of these three successive operations—(1) The preparation of alumina from bauxite, by furnacing the bauxite in admixture with sodium carbonate, dissolving out the resulting sodium aluminate, and then treating the solution so obtained by CO_2 ; (2) the preparation of double chloride of aluminium and sodium, by mixing with carbon the alumina obtained in the first operation, drying the resulting mixture of alumina and carbon, and then heating it in a current of chlorine; and (3) the reduction by free sodium of the Al_2Cl_6 of the double chloride so obtained. There is no need that I should take up your time with any description of these three operations, since they are described with perfect accuracy in books which all those of the members present who have any special interest in the subject are certain to have in their libraries. Perhaps the best accounts of them are that given in the sixth edition of Payen's *Précis de Chimie Industrielle* and that in Wurtz's *Rapport sur l'Exposition de Vienne*.

It is to the cost of the three operations respectively that I wish to direct your attention. I am not free to state their actual cost, but I can state the cost of each in terms of the total cost of all three. If the total cost of a unit of aluminium at Salindres be called 100 the cost of the first operation, including that of the bauxite upon which it is performed, is 96.7, that of the second operation is 38.4, and that of the third operation, including the cost of the sodium used in it and also that of the cryolite employed as a flux, is 56.93. The first operation is thus comparatively inexpensive, the second operation costs two and a half times as much as the first, and the third operation costs one and one-third times as much as the first and second operations put together.

It follows that to produce aluminium at a cost appreciably lower than the present cost of aluminium at Salindres, either one must produce it by a process quite different from Deville's, or one must cheapen either the second operation of Deville's process or the third operation of that process, or both its second and its third operations; since to reduce the cost of the first operation even to nothing at all, the second and third operations of it remaining as costly as at present would cheapen aluminium only by 9.6 per cent.

How far, then, has Mr. Webster cheapened aluminium? He has not invented any new process for its manufacture. His invention relates simply to the obtainment of anhydrous alumina from potash alum. If his method of obtaining alumina were 50 per cent. cheaper than the Salindres method it would thus be capable of reducing the cost of aluminium only by less than 5 per cent.; but his method is twice or three times as costly as the Salindres method. Towards the cheapening of aluminium, therefore, Mr. Webster has done nothing at all.

As yet, then, the only method known for the manufacture of aluminium is Deville's. Mr. Pechiney has improved and cheapened the modes of working and the appliances for carrying that method into effect; but this is all the progress which has been made in the manufacture of aluminium during the last 25 years.

Such being the present position of the aluminium manufacture, what are its prospects? I find that quite a considerable number of persons, quite independently of each other, are endeavouring to reduce alumina by carbon. It is often rash to say that a proposed thing can never be done, but that alumina can ever be reduced by carbon is surely as impossible as that two and two can ever make five or one foot-pound of energy be made to do two foot-pounds of work. When 2×27.3 parts of aluminium combine with 3×16 parts of oxygen there is liberated as heat a quantity of energy capable of raising 391,600 parts of water from 0°C . to 1°C . To abstract by purely chemical action the oxygen of the resulting alumina, leaving its aluminium free, one must cause to react upon the alumina a body by whose combination with oxygen more than 391,600 calories are liberated, and carbon is certainly not such a body.

If, then, we cannot hope to reduce Al_2O_3 by carbon or Al_2Cl_6 , by hydrogen, in what direction can we look for the cheapening of aluminium? It seems to me that there are four conceivable resources. There are doubtless others, but all I can see are these:—1. The cheapening of Al_2Cl_6 , 2NaCl .—2. The substitution for Al_2Cl_6 , 2NaCl of some other anhydrous compound of Al, not containing oxygen.—3. The substitution for sodium of some cheaper reducing agent.—4. The cheapening of sodium itself. Mr. Pechiney has already effected important economies in the production of Al_2Cl_6 , 2NaCl , and will probably effect others. The production of a cheaper haloid salt of aluminium than $\text{Na}_3\text{Al}_2\text{Cl}_6$ would at first blush seem difficult, but is not I think impossible; and a cheaper agent than sodium, capable of reducing certain salts of aluminium, I believe that I could now indicate if I were free to do so.

As for cheaper sodium, sodium no doubt will be cheapened. To manufacture a ton of sodium at present costs roughly between 300/- and 350/- The quantity of sodium carbonate containing a ton of sodium at present costs in the market about 16/- The manufacturer of sodium, however, obtains only about a third of the sodium contained in his raw material. He effects only a partial dissociation of his Na_2O , and to that partial dissociation there succeeds partial reassociation. Still, three times 16/- for raw material leaves from 250/- to 300/- for the cost of extracting a ton of sodium from about 7 tons of Na_2CO_3 .

The largest item in this excessive cost of extraction is for the vessels in which the Na_2CO_3 is heated in admixture with powdered coal. It has not hitherto been found possible to heat the mixture of Na_2CO_3 and powdered coal to the necessary temperature except in cylindrical wrought-iron vessels of very small diameter, and these small wrought-iron cylinders are so rapidly destroyed that their cost stands for fully one-half of the present total cost of sodium, and for nearly one-third of the present total cost of aluminium.

There is surely room here for improvement, and the cost of sodium for this item will doubtless be diminished. Still one can hardly hope that sodium can ever become cheap enough to permit of aluminium reduced by sodium being largely applied to the many practical uses of which aluminium is capable. A cheaper reducing agent than sodium, and a cheaper artificial ore of aluminium than Al_2Cl_6 , 2NaCl : these I think are essential to aluminium becoming commonly and extensively employed.

WIRE CLOTH SCREENS.—The economy of the screens used in connection with the dressing of ores depending in a great measure upon the quality of the wire used, Messrs. R. JOHNSON, CLAPHAM, and MORRIS, of Manchester, have recently been turning their attention to the subject, and are now introducing an entirely new manufacture, of great importance to users of wire cloth for screening ores, sifting cement, and in fact for all purposes where perfect screening

is necessary. The improvement consists in hardening and tempering steel wire cloth after manufacture. The web, it need scarcely be remarked, is largely in use everywhere, its applications in various branches of industry being very numerous; but up to the present time it has never been hardened after manufacture. The process has been patented, and the web is found to last many times longer than the ordinary style of woven wire.

TREATMENT OF COMPLEX ORES, AND CONDENSATION OF LEAD FUMES—No. I.

The treatment of complex ores and the condensation of lead fumes have been for many years important problems in metallurgy; and in a paper read before the Institution of Civil Engineers—and now reprinted in the Other Selected Papers edited by the indefatigable secretary, Mr. James Forrest—Mr. J. W. Chenhall, A.M.I.C.E., gives the result of his own personal experience in dealing with them. He explains that complex ores belong to that class which, containing two or more minerals, cannot be separated by mechanical means (dressing), or by any of the ordinary smelting processes as pursued in copper smelting, lead smelting, or gold and silver works. The presence of zinc in copper or lead ore, even to the extent of 5 to 7 per cent., interferes materially with the reduction, and when present to the extent of 25 to 30 per cent. considerably deteriorates the value of the other metals contained in the ore, and in many cases prevents their profitable extraction.

In the case of copper ores the presence of zinc makes them infusible, and depreciates the quality of the copper, necessitating additional softening operations. Zinc will not combine with the silicious gangue of the ore until oxidised, oxidation taking place very slowly, even when the conditions are otherwise most favourable; but the conditions in the reverberatory copper smelting furnace are anything but favourable to the oxidation of the ore. Instances are known to the author of charges of copper ore remaining in the furnaces from 12 to 15 hours instead of 5 hours, the usual time for smelting, in consequence of the presence of zinc in the ore. Greater inconvenience still occurs from the presence of a large percentage of zinc in lead ores, as when the ordinary smelting processes are pursued not only are the operations impeded thereby, but there is also a considerable loss of lead through volatilisation, arising from the increased length of time the lead products are exposed to the action of the furnace fires; and further, ores of this complex character are not adapted to the use of the zinc or spelter manufacturer even when the percentage of zinc present is suitable for this process. From the peculiar nature of zinc smelting, which is conducted in earthen retorts, it is of essential importance there should be no element present which would readily destroy the retorts. Now, the presence of lead in zinc ore is most objectionable, as it speedily destroys the retorts. Purely zinc ores, containing less than 30 per cent. of zinc, are considered valueless in this country, although ores of much lower percentage are worked on the Continent, where labour is cheap; hence the necessity of resorting to some method of separating the zinc from the other metals before the ordinary smelting processes are pursued. The mechanical method of dressing is, however, always adopted whenever practicable. In ordinarily mixed ores containing galena and blende, the separation is easily accomplished by the great difference between the specific gravities of these two minerals; but in many cases separation by dressing is impracticable, and in others impossible; thus blende and copper pyrites resemble each other so closely in density as not to allow of their separation by dressing. Again, blende and galena are often so intimately mixed (forming apparently a homogeneous mineral) that their separation by dressing is too difficult to be practised on a large scale. The plumbiferous blende found in Anglesea, commonly known as bluestone, is of this character. Large quantities of copper ores are also obtainable, the working of which would be remunerative were it not for the injurious influence of zinc present in the ores, varying from 20 per cent. upwards—hitherto the highest prices paid by the copper smelters for such ores have been unremunerative to mining proprietors.

In February, 1877, Mr. Edward Andrew Parnell, of Swansea, took out a patent, No. 820, for improvements in the manufacture of metallic zinc and sulphuric acid, and it has been the development of that patent which has led to the successful treatment of the ores under consideration, the gist of which consists in the dissolving of oxide of zinc from calcined ore by sulphuric acid, and the after decomposition of the sulphate of zinc by sulphide of zinc or carbon. When heated alone sulphate of zinc requires a very high temperature to effect its decomposition. Such a method is impracticable on a large scale; but when mixed with a deoxidising agent sufficient to take one equivalent of oxygen from the sulphate, it is easily decomposed, the product being oxide of zinc and sulphurous acid. A mixture of two equivalents of sulphate of zinc with one equivalent of carbon, heated to dull redness, affords oxide of zinc. With a large proportion of carbon sulphide of zinc is produced. A like decomposition is effected by means of sulphide of zinc, whether native or artificial; but at a considerably higher temperature three equivalents of Zn_2SO_4 (sulphate of zinc), and one equivalent of Zn_2S (sulphide of zinc) produce four equivalents of oxide of zinc, and four equivalents of sulphurous acid ($3 \text{Zn}_2\text{SO}_4 + \text{Zn}_2\text{S} = \text{Zn}_2\text{O} + 4\text{SO}_2$). Native sulphide (zinc blende) is the reducing agent preferred on the large scale for making oxide of zinc suitable for the manufacture of zinc or spelter.

In the treatment of the ores already described it is found expedient to divide them into two classes—those in the first class, which contain zinc in sufficiently large quantities for its extraction by Mr. Parnell's process, which should be from 15 to 35 per cent. of zinc; and those of the second class, which vary from 5 to 15 per cent. of zinc. It is proposed here to deal first with the classes of ores rich in zinc, and the poorer ones afterwards. The mode of treatment for the ores rich in zinc is, in the first place, to grind it sufficiently fine to pass through a sieve of six or eight holes to the lineal inch. This is accomplished by passing the large lumps of ore through a Blake's stone-breaker, and from thence through a Cornish crushing-mill, having two series of rolls, the upper ones being fluted on their faces, and the lower ones plain. The only point in this mill calling for special remark is the introduction of india-rubber buffers instead of springs or levers to allow the opening of the rolls during the passage through of the material, and to give the necessary pressure for crushing.

The next stage is to calcine the ground ore by exposure to air at a moderate heat; this is effected in muffled furnaces, 46 ft. in length by 15 ft. in width, outside measurement. The furnace is so constructed that the heated gases from the fire-place pass along above the muffled arch, and then descend at the opposite end of the furnace, traversing the flues under the working bed twice before their exit to the chimney flue; thus the products of combustion travel a distance of about 120 ft. before escaping to the chimney. There is no difficulty in keeping this furnace at a uniform heat throughout its whole length, with the consumption of about 13 to 14 tons of coal per week. It is of the utmost importance that the operation should be conducted at a moderate temperature to allow as much of the sulphide of zinc as possible to be transformed into sulphate of zinc in order to reduce the consumption of sulphuric acid in its after treatment; and, further, if the ore be calcined at a very high temperature the zinc is not so readily dissolved out; silicate of zinc and silicate of lead being formed produce a gelatinous silicate, which impedes the after-washing of the ore, and delays the settling of the fine ore in suspension.

IRON MANUFACTURE IN FRANCE.—The ironworks erected by the Compagnie des Forges de St. Nazaire are now in full work, and give employment to about 1700 workmen. The quantity of rails, iron bars, and iron and steel plates to be manufactured this year will be from 60,000 to 75,000 tons, of the value of from 12,000,000 francs to 15,000,000 francs. The machinery at these works is driven by 42 steam-engines of the combined force of 7600 horse power, of which about 3000-horse power is kept constantly in motion day and night. A considerable portion of their most powerful machinery has been imported from England. The quantity of coal consumed in the works is about 180,000 tons per year, all of which is imported from England. The firm of MM. Godard and Co. import 160,000 tons of large and

small coal, and 10,000 tons of pitch, and they manufacture about 70,000 tons of patent fuel at their works, which give employment to 200 workmen. Another company has been formed for the manufacturing of patent fuel on a very large scale. The ironworks at Bassé Indre, some seven or eight miles below Nantes, produced during the past year nearly 8000 tons of bar and sheet iron and plates; they give employment to over 400 hands. A short distance below Bassé Indre are the leadworks of Couëron, formerly the property of an English company, but now a joint Anglo-French concern. They employ some 450 hands, and during the past year produced—Lead, 7500 tons; shot, 400 tons; and sheet lead, &c., 800 tons.

Original Correspondence.

MURDOCK AND THE TREVITHICK MEMORIAL.

SIR,—It is no light matter to enter the arena with so distinguished a literary pentathlete as Dr. Hyde Clarke. But despite the profound respect I entertain for his rare mental energy and the extensive variety of his acquirements I am bound to state that I do not think he has succeeded—even on the special line of argument he has elected to follow—in proving the priority of Trevithick's claim to recognition in comparison with Murdock, as the father of the industry of steam propulsion in its application to wheeled vehicles. I possess a complete acquaintance with the history of Trevithick's successful development of the high-pressure engine up to the point at which it was simplified and improved by Boulton and Watt, especially by Hedley; and I cheerfully accord to the eminent Cornish engineer the fullest credit for giving practical effect, in a decidedly advanced form, to Murdock's invention. What I still venture to maintain, however, is—with all deference to my venerable and learned friend, Dr. Clarke—that the ideas which Trevithick embodied were derived from Murdock's working model and this inventor's personal exposition of the principles on which that model was constructed.

I am quite prepared to concede Dr. Clarke's self-evident assertion that the mere antecedence, in time, of an invention or discovery to an invention or discovery of a similar character, which has been introduced directly into permanent use, does not necessarily constitute the prior inventor or discoverer the founder of the industry which happens to result from the particular novelty invented.

Dr. Clarke has supplied several apposite illustrations of this position. He has reminded us, for instance, that the inflammable properties of carburetted hydrogen had been observed by Shirley, Lowther, Clayton, Boyle, Duncanson, Hales, and Watson within the century and a quarter preceding Murdock's investigations, without these predecessors of Murdock being entitled to the honour of having established gas as a lasting public and domestic institution. By parity of reasoning Dr. Clarke, if I correctly understand the point of his remarks, seeks to prove that Trevithick, as carrying steam locomotion on land to a stage never reached by Murdock in his model engine, sustains the same relation to the latter which Murdock did in gas exploration to the succession of original and independent observers who preceded him, as the founder of the gas industry Nay, so precipitate does Dr. Clarke appear to be in compelling the attention of his readers to this as the right view that he is unconsciously hurried into ignoring every suggestive hint Trevithick is well known to have received from Murdock on the high-pressure engine, apparently aiming at conveying the impression that whatever light penetrated Trevithick's mind from previous inventors was derived from "Recueil des Machines." Surely he doth protest too much" in glorifying his hero to the unintentional disregard of Murdock. The fallacy by which Dr. Clarke has been misled lurks in the fact that while there was no relation of dependence between Murdock's experiments in gas and those of the men who went before him in the same sphere. This could not be truthfully said of the work of Trevithick, which was simply an extension and development of Murdock's principle imbibed by the pupil from his master. It is irrelevant for the purpose of depriving Murdock of the paternity of practical steam locomotion on land to say that Cugnot invented a locomotive carriage in 1770, while Murdock did not run his model at Redruth until 1784. The answer is that Murdock was in no way indebted to the locomotive of Cugnot, because he was ignorant of its existence until after his own model was completed. Up to that period he had no guidance but what he obtained from Watt's engines.

This brings us to the chief consideration. Between Murdock, in 1792, and his predecessors in the study of the combustibility of gas, up to Shirley, in 1659, there are links, but these links are detached, having no connection or lineal dependence on each other—at least, as far as Murdock is concerned. The same may be said as to Murdock's position in reference to Cugnot's engine as affecting the elaboration of his own working model. But the case was totally different as regards Trevithick in relation to Murdock. *Apropos* of the Luther celebration, now in progress, it has been said by D'Aubigné, speaking of the Protestant Reformation, "Erasmus laid the egg, and Luther hatched it." So far the principle of Murdock's model engine was the germ deposited in Trevithick's mind from previous inventors in 1804-5 on a railway in South Wales, and subsequently under the fostering care of Hedley and Stephenson in the vast railway systems of the civilised world. I have heard substantially this view expressed by no less an authority than Dr. Smiles, before an assembly largely composed of engineering experts, and nothing advanced by Stuart or Professor Pole can alter the fact that on the very mode of argument adopted by Dr. Clarke, Murdock is not only the founder of the gas interest, but the real father of steam propulsion as applied to wheeled vehicles.

I am perfectly aware that Murdock has earned enough laurels to bedeck his brow in the gas enterprise alone, and if other inventors had not been put forward to appropriate a distinction which is justly his in the sphere of steam locomotion I should be content to let his flagrantly-rejected claims to worthy commemoration rest exclusively upon his introduction of a splendid system of artificial illumination; but as the parent of steam locomotion on land it is exceptionally opportune that all civilised communities should combine at this moment to confer upon him a too-long-postponed honour. It will be exactly a century in 1884 since Murdock ran his pioneer engine on the road at Redruth—the source at which the fire of Trevithick's locomotive genius first kindled, his joint patent with Andrew Vivian not being taken out till 1802. Next year, consequently, will be the centenary of the birth of practical steam road locomotion, in the sense not simply of an invention, but of an invention which germinated. There is the virtue of "apostolical succession" in engineering as in ecclesiastical tradition, and Murdock was the "prince of apostles," an organic connection binding him with Trevithick as second in the canonical line of successors who have gradually developed and perfected, as locomotive engineers, what he initiated. It would only be becoming, therefore, that the railway companies should combine with the gas companies everywhere in celebrating in a fitting manner the originator of both their industries. An opportunity will be afforded towards the close of the present month for so doing, when a preliminary committee of influence will be formed to take the necessary steps for promoting this object. Already action has been commenced in the cause north of the Tweed.

It is sufficient to add that Dr. Hyde Clarke's statement respecting Boulton and Watt's omission to take notice that Trevithick and Vivian's patent had been forestalled by their foreman has not the slightest force as invalidating Murdock's right to the distinction of having started in Trevithick's mind the train of thought which ripened in the general adoption of the railway system. Murdock, unfortunately for his own advantage, was too unselfish to think of protecting his most important inventions by patent. He gave gas as a free gift to the world, and the same abandon to his art as an inventor made him similarly forget all about the desirableness of patenting his locomotive. But to the credit of Boulton be it said that he proposed to advance Murdock 100/- to prosecute his experiments in steam locomotion. There was an additional offer on the part of his employer. If within a year he should be able to complete an engine carrying two persons with the driver and 200 lbs. of

luggage, fuel for four hours and water for two hours, to run at the rate of four miles an hour, a partnership in the enterprise should be struck with the proprietors of the Soho Works. But Murdock, though confident of success, was so handicapped with daily responsibilities in superintending the Cornish engine manufactured by Boulton and Watt that he had not the requisite time to devote to the affair. The one barrier to Murdock's material advancement was his genuine modesty, and a disposition to underrate his own achievements. Had he accepted the modern maxim, that as a rule, unless a man is a palpable quack, the world takes him at his own valuation of himself, he might have died a millionaire, and monuments have long ago been erected to his memory all over the world. But his worth, like the precious metals, did not lie on the surface, having to be rescued from threatened oblivion caused by his own retirement and self abnegation.—*Highbury, Nov. 9.*

M. MACFIE.

THE COAL TRADE

Mr. J. R. Scott, the Reg. the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London, by sea, railway, and canal, during October, 1883:—

IMPORTS.

By Sea.	Ships.	Tons.	By Railway and Canal.	Tons.	ewt.
Newcastle	222	221,718	Lond. & N.-Western	132,941	15
Sunderland	123	107,213	Great Northern	121,584	0
Seaham	28	18,412	Great Western	110,380	0
Hartlepool	42	19,532	Midland	217,541	0
Scotch	7	3,137	Great Eastern	65,837	19
Welsh	32	27,133	South-Western	4,807	8
Yorkshire	22	4,250	South-Eastern	2,399	7
Small coal, cinders	13	4,370	Grand Junction Canal	660	5
Colonial	1	99			
Total	488	405,927			
Imports—1882	455	372,231			

Comparative Statement, 1882 and 1883.

By Sea.	Ships.	Tons.	By Railway and Canal.	Tons	ewt.
Jan. 1 to Oct. 30, 1883.	4103	3,239,620	Jan. 1 to Oct. 31, 1883	5,774,963	19
Jan. 1 to Oct. 30, 1882.	4165	3,091,289	Jan. 1 to Oct. 31, 1882	5,333,083	16

Increase—1883 148,331

Decrease—1883 62

Exports.

Railway-borne coal passing "in transitu" through district	Tons	122,929
Sea-borne coal exported to British Possessions, or to foreign parts, or to the coast		64,320
Ditto sent beyond limits by railway		19,562
Ditto by canal and inland navigation		1508
Railway-borne coal exported to British Possessions, or to foreign parts, or to the coast		25,274
Ditto by rail beyond district		56
Ditto, by canal and inland navigation		80
Sea-borne coal brought into port, & exported in same ships		46
Total quantity of coal conveyed beyond limits of coal duty district		233,775
Ditto, during Oct., 1882		242,287

Comparative Statement, 1882 and 1883.

Total distribution of coal from Jan. 1 to Oct. 31, 1883 2,328,355

Total distribution of coal from Jan. 1 to Oct. 31, 1882 2,204,532

Increase in the present year 123,823

General Statement, 1882 and 1883.

Increase in coals imported by sea during the present year 148,331

Increase in coals imported by railway and canal 441,880—590,211

Less increase in coals exported 123,823

Total increase in trade within the London district during present year 466,388

MANGANIFEROUS CHROMEISEN.

In connection with the manufacture of steel and with the production and application of certain alloys by the use of which steel is made to possess the apparently paradoxical properties of increased hardness, toughness, and ductility a process has been suggested by Mr. A. ARMITAGE, of Sheffield. He claims that this desirable end is attained by the introduction of from 0·1 to 2·0 per cent. chromium into the molten metal either in the form which he calls mangani ferous chromeisen or in the form of chrome spiegel, or in both such forms, the name given being dependent upon the quantity of silicon and graphite contained in the alloy which in either case is to contain in addition to the usual proportions of the constituents of spiegel 1 to 10 per cent. of chromium. These alloys may be obtained by smelting in the blast-furnace mixtures of mangani ferous iron ores and chrome iron ores together with lime and alumina compounds so as to produce a highly basic slag, and thus prevent loss of chromium. An excess of manganese being also used to prevent the chromium slagging out.

If the product be mangani ferous chromeisen, that is an alloy containing a certain percentage of silicon and graphite the said alloy is mixed with the requisite proportions of pig-iron, and subsequently melted therewith and the molten mixture converted into steel in the ordinary manner. The manganese present in the metal it is anticipated will prevent partially or totally the oxidation of the chromium during the conversion of the metal into steel. If the alloy obtained is chrome spiegel, that is should it contain such small proportions of silicon and graphite as will render it uninjurious if added directly to the metal when in its molten state in the converter furnace or ladle then the alloy may be used alone or mixed with ferro-manganese or spiegel either in the solid state or run into the converter furnace or ladle after melting and whether or not chromium has already been introduced into the metal by the use of mangani ferous chromeisen or otherwise; by this process oxidation will be avoided, and the whole or greater portion of the total chromium contained in the chrome spiegel will be found in the steel.

IMPROVED STEEL-MAKING FURNACE.

The improved furnaces invented by Messrs. DICK and RILEY, of the Steel Company of Scotland, are of the kind in which gaseous fuel is used, and in connection with which heat regenerators are employed. The regenerative chambers are buildings detached from the main furnace building, and where four are used as will generally be the case, are arranged in two pairs at the ends of the space with the furnace between them. Each chamber may be wholly detached, or each pair may be formed in one building side by side, or one above the other. The chambers are built, according to one modification, so as at their upper parts to communicate as directly as possible with the furnace, being close to the furnace, or connected to it by very short flues. Each regenerative chamber is by preference of a cylindrical form, and consists of an iron or steel shell lined with fire-brick. The communications between the chimney and the chambers used respectively for heating the gas and the air are controlled by separate valves; and sight holes are provided to allow of the internal condition being ascertained at any time. The tops of the chambers are by preference made removable, in the modification now being described, and each entire chamber may be made portable so that it can be raised for the purpose of emptying out the brick checkerwork with which the chamber is filled as usual. Any one of the regenerative chambers or the furnace may be cooled down and repaired by itself without its being necessary to disturb or cool the other parts.

The main furnace is constructed, according to one modification, within a cylindrical shell of iron or steel lined with fire-brick and silica bricks. The roof or dome consists of fire-brick bound by an iron or steel ring, and is by preference made removable for the purpose of charging the furnace, an arrangement effecting a considerable saving of time, and allowing of "skulls" being charged without previous breaking; whilst the side thrust on the walls, which is caused by the ordinary construction of roof is avoided. Diametrically opposite ports are formed for the ingress and egress of the gases into and from the furnace. The parts in which these ports are formed are much less costly and troublesome, and much more easily renewed than the "blocks" of existing furnaces worked with gaseous fuel. The improved construction also allows of what are known as basic bricks being used more economically and advantageously than in existing furnaces. The furnace may be made of an oval or rectangular form in plan, but the inventor believes the circular form to be the best. The regenerative chambers may also be made of various

forms, preference being given to the circular or cylindrical form. The regenerative chambers may be built on pillars or otherwise in a relatively elevated position, so that the communications between them and the furnace may be at their bottom parts instead of at their upper parts, which improved arrangement will completely prevent their being obstructed or injured by the running in of fused fire-brick or slag.

UTILISATION OF POOR COPPER ORES.

The wet process for the reduction of certain poor cuprous ores formerly in use at the Maidanpek Mines, in Servia, formed the subject of an interesting paper by Mr. BRENTON SYMONS, Assoc. M.I.C.E., read before the Mining Institute of Cornwall, on Tuesday evening. The process was perfected by Mr. Symons whilst at the mines. The author stated that when some recognised chemical reactions are combined in some sequence of operations to establish a process for the elimination of a metal from its matrix, it was often patented and published to the mining community as a comprehensive method to be used for the reduction of all ores enclosing such metal, and much disappointment had occasionally befallen companies which had been induced to work processes that in practice had failed to satisfy the requirements demanded. The species of cuprous minerals found in large deposits were so rarely of homogenous structure that the details of any particular process could not be indiscriminately applied to their reduction because, although the general principles of most hydro-metallurgical methods for the extraction of copper from ores of low grade possessed a generic similitude, difference in cohesion, composition, structure, and other qualities might determine the failure of a process if insufficiently appreciated.

In all ores of meagre percentage the greatest importance must be attached to thoroughness of extraction, and no treatment should be considered satisfactory, either chemically or commercially, which permitted an undue portion of the metallic tenure to remain in the residues. In the East of Europe there were not a few mineral properties which contained large reserves so dissimilar that the ores from each mine treated separately would require a process essentially modified. Such was the case with the diverse ores proceeding from the Maidanpek deposits, and it was this disparity that had led to so many disheartening and expensive experiments before a method which would include the various oxides and sulphides was arrived at. Mr. Symons noticed briefly the geological structure of the rocks which enclosed these enormous deposits, and made some observations on the minerals therein segregated, and then spoke of the advantages of the Maidanpek process (which he observed was the final outcome of numerous attempts which were made to develop an economic system of reduction), the advantages being principally cheapness, and the obtaining of more copper out of the material.

The machinery which was requisite to carry out the system did not demand an outlay of very considerable amount. As to the cost of treatment, taking the small quantity of 10,000 tons, the cost per ton of ore would be nearly—mine cost per ton, 2s. 10d.; transport, 1s. 10d.; reduction charges, 1s. 11d.; administration, including officers and mechanics, 2s.; total, 8s. 7d.; but the completion of tramways from the Maidanpek Mines to the works would reduce the cost per ton to 7s. 6d. The galleries driven to extract smelting ores had left stopes which contained more than 100,000 tons of ore in sight, the cuprous value of which had been shown by numerous assays to average very nearly 1½ per cent. Admitting that the process was equal to the separation of 1½ per cent. of the teneur, each ton of copper placed in the market would cost 35/- After paying 1-20th mine dues, a profit of about 7s. on each ton of ore treated would be left, reckoning Chili bars at 65/- The writer, who directed the Maidanpek Copper and Iron Works for 10 years, claimed the invention of no new reaction, and any advantages the method might possess was due simply to the admixture of the ores and to the liberation of the ferric excess, which in many processes clogged the bath, and produced a muddy precipitate of copper.

In the course of the discussion which followed Mr. R. Symons stated, in reply to Mr. R. J. Frecheville, Her Majesty's Inspector of Mines, that his son (Mr. Brenton Symons is absent from England) informed him that wages in Servia were lower than in Cornwall. The owners of the Maidanpek Mines had stated that since his son had left that mine, and the process in question had been abandoned there, they had lost some 200,000 or 300,000 a month in the mine. Mr. Symons also thought that there was a quantity of material on Cornish mines which was not utilised, and submitted the following result of assay which Capt. Richard Pryor had made of the attle at Clifford Amalgamated Mine, Gwennap, the samples being fairly taken—Copper, 2 to 2½ per cent.; silver, 2½ to 3½ ozs. per ton; arsenic, 12 to 13 per cent.; tin residue, 14 or 15 lbs. per ton of attle.

Mr. Frecheville remarked that he thought the paper most valuable. A process had been elaborated in it which, while it contained no new principle in metallurgy, was yet very ingenious, though it was applicable to a kind of ore which did not obtain in this country. From the samples before the meeting Mr. Frecheville saw no reason why the process, if continued, should not give good results. It was very clear that Mr. Symons had carefully considered the whole question; and, although we had no mines in this county where ores similar to those found at Maidanpek existed, yet as Cornishmen went all over the world it was very likely that the paper might be of use to some member of the Institute. Mr. Brenton Symons promises a paper "On the Utilisation of Low-price Ores," such as are thrown over the wastes of Cornish mines, and no doubt is entertained that it will attract considerable attention.

CALCINING AND ROASTING SULPHUR ORES.

The apparatus invented by Mr. I. S. McDougall, of Chadderton, consists of a series of superposed chambers or floors furnished with rakes or agitators and feeders by means of which the materials under treatment are fed continuously through the series of chambers whilst being submitted to the burning, calcining, or roasting process. The said rakes or agitators and feeders are fixed to a main shaft passing through the chambers which are provided with openings or passages from chamber to chamber alternately at the centre and at the side so that the materials are passed by the said rakes across each floor and from chamber to chamber throughout the series of chambers constituting the furnace until the said materials are finally delivered out of the said furnace. The said shaft and the said rakes when made of cast-iron and exposed to great heat are liable to warp and break when strained. To obviate this he makes the said shaft and rakes hollow, and provides them with wrought metal pipes fixed in their interiors and forming an inner wrought metal lining to the cast metal. In order to render it possible to replace the shaft without removing the floors of the chambers he provides the shaft at each place where the rakes are to be fixed thereto with shoulders, and the rakes with a forked inner end which embraces the shaft. A pin or cotter is passed through the forked ends of the rake to secure it to the shaft, and by withdrawing this cotter the rakes may be readily removed from the shaft, which can then be withdrawn from the furnace for renewal or repair.

In order that the shaft may be readily removed for repairs or other purpose after the rakes are removed as hereinbefore described (without the necessity for breaking the floors) on each alternate floor where the material passes through a passage at the side he furnishes the centre floor box through which the shaft passes with a flanged moveable cover resting on a flange on the floor box and fitting round the shaft by which arrangement the shaft can readily be removed through the floors and out at the top of the furnace. A loose piece of hard steel may be fixed to the bottom of the shaft working on a loose steel disc, so that the said loose pieces take the wear and when worn can be readily replaced without necessitating the renewal of the shaft.

In order to adapt the furnace for use for treating various kinds of materials requiring submission to the heat of the furnace for a longer or shorter period he provides in addition to the feeding hopper at the top other hoppers communicating with floors at different levels through which the different materials may be fed at the same time according to the number of the chambers through which they are required to pass. In order to dry the materials (where desirable) before they are fed into the chamber he provides a floor outside the

roof of the top chamber and furnishes this floor with a rake so that the material being fed on to the said floor is dried thereon, and then by the operation of the said rake is fed therefrom into the top chamber.

The invention relates further to the provision of means for freeing the gases from dust and solid impurities immediately after leaving the furnace and before they pass to the chamber or vessels in which their utilisation or chemical combination or treatment takes place. These means consist of a chamber divided by a series of plates or baffles having holes or perforations therein. The holes in the one plate or baffle are not opposite those in the adjacent plates or baffles, so that the dust and solid impurities are impeded by the said plates as the gases pass through the holes and the said dust and solid impurities fall to the lower part of the chamber. The bottom parts of the said plates or baffles are without holes and a damper is provided between each plate or baffle which on being moved into position closes in the space between the lower unperforated parts of the said plates or baffles and cuts off the enclosed space so that the gas has not access thereto. These dampers are for the purpose of thus being placed in position to allow of the dust and solid impurities being removed from between the plates without permitting access of air to the gas. The said chamber can be made to answer the purpose of a nitre oven by providing bearing bars and other parts within the said chamber for supporting the nitre pots and suitable doors for the charging and removal of the nitre pots. The vertical shaft may be rotated by any convenient gearing from the source of motive-power and connections may be made from the said gearing for operating charging pistons for pushing the material from the hopper or hoppers on to the drying-floor or into the chambers of the furnace. Each chamber may be provided with a manhole or manholes for gaining access thereto when required.

LOCAL TAXATION, AND THE RATING OF MACHINERY.—The second edition of Mr. T. F. Hedley's report on the rating of machinery, with notes of the special cases, &c., in Laing v. the Overseers of Bishopswearmouth, with an appendix containing a description of the machinery included in the special case, and so on, has just been issued in a handsome volume by Messrs. Knight and Co., of Fleet-street. Mr. Hedley's views upon this question are already well known, so that it will suffice to say that he puts forward the same arguments as before. He complains that the "instructional letter to the overseers of the Poor and Union Assessment Committees" embodying his views has not been issued by the Local Government Board, although he suggested such issue in 1878. He understands that the reason for not issuing such an instructional letter on the subject is that "the board never interferes with Local Assessments," and it is to be hoped that that principle will long be adhered to. As a work of reference Mr. Hedley's book will prove of considerable value to a very large class of readers.

HOLLOWAY'S OINTMENT AND PILLS—FEMALE COMPLAINTS.—On the mothers of England devolves much and serious responsibility in securing for their daughters robust health; frequently, alas! thoughtlessly sacrificed by culpable baseness at a particular period of life, when all important changes take place in the female constitution, upon the management of which depend future happiness or misery. Holloway's pills, especially if aided with the ointment, have the happiest effect in establishing those functions, upon the due performance of which health and even life itself depend. Mother and daughter may safely use these powerful debstucent remedies without consulting anyone. Universally adopted as the one grand remedy for female complaints these pills never fail, never weaken the system, and always bring about the desired result.

LEAD ORES.

Date.</th

TO SPECULATORS.

As the attention which American mining investments has recently received from English noblemen and capitalists suggests the advent of extensive operations, Messrs. ARCHER and SON deem it opportune to address a few words of enlightenment to those readers of the *Mining Journal* who may feel favourably inclined to participate in the movement. Although mining in Britain has given some marvellous results they are illiput as compared with the results of American mining, which on the most trifling outlays—sometimes only a few dollars—has in almost innumerable instances given colossal fortunes, but as the mineral resources of the Great West are so boundless it necessarily follows foreign capital is necessary to its development, and some idea may be formed of the prospects of unusual returns to those who may have the temerity to make a tentative venture to refer to the fact that the total dividends paid by 28 mining companies during the present year to end of September last aggregated the enormous sum of nearly \$8,000,000 or £1,600,000 sterling. More by a vast extent than the profits during the same period of all the mines in the world. As agents for a company which has a brilliant future Messrs. ARCHER and SON invite attention to its prospects, and therefore beg to introduce

THE ROCKY MOUNTAIN MINE DEVELOPING COMPANY.

This company, which was duly incorporated under the State laws of Colorado on July 5, 1881, was inaugurated with more extensive objects than those of an ordinary mining enterprise, inasmuch as they include smelting, and consequently more of a commercial than speculative undertaking. Moreover, instead of confining its prospects to the result of opening up one mine, as is usually the case, its capital is devoted to the development of several properties, thus distributing the risk and minimising the possibility of an unprofitable result; the plan being to select from amongst a number of young speculations those languishing from want of funds capable of being leased or purchased at a nominal cost, and which give prospects that a vigorous development would render profitable results.

The properties thus selected so far and acquired by the company are as follows:—

First.—An interest in the Lone Star Consolidated Mining Company, amounting to one-half of its capital stock, the mines of which are contiguous to the "London Mine" branch of the Denver, South Park, and Pacific Railway, near Olma Park County, consisting of two claims on a vein opened by a shaft 200 feet deep, yielding ores containing from 30 to 2000 ozs. of silver to the ton, and which are rapidly merging into a dividend-paying state.

Second.—One-half of the Lake Side vein, situated eight miles above "Crested Butte," Gunnison County, near the end of the "Crested Butte" branch of the Denver and Rio Grande Railway. This property possesses a magnificent vein of lead, giving an average of 170 ozs. of silver to a ton of ore, and 40 per cent. of lead, and is opened by a tunnel 600 feet below the surface. The profits from the development of this property alone will, it is generally understood, permit of large dividends on the capital stock of the company.

Third.—One-half of the "Wide West" and "New Era" veins, situated eight miles from Copiaxti station on the same railway in Fremont County. Its production is copper ore, yielding 25 per cent. of metallic copper at the very shallow depth of 40 feet. When further depth is gained and the vein thoroughly opened out and operated on at various points, great and profitable returns will be a natural result. It may be instructive as showing the richness of these ores—25 per cent. of metal—to compare this high rate with the yield of English copper ores, the average of which is only 7 per cent.

Fourth.—All of the Green Mountain group, consisting of three full claims of 4500 feet in length by 300 feet in width, situated 12 miles from Canyon City, near the Silver Cliff branch of the Denver and Rio Grande Railway on a vein of quartz of the extraordinary width of 100 feet, which is in reality one immense mass of oxide and sulphuret copper ores, and which has been explored by shafts and drifts 1000 feet in length and 160 feet in depth, and increasing at the rate of 3 feet per day. It is generally conceded by mining authorities that the development of this enormous vein may be expected to give such a yield as will place this property amongst the most celebrated copper-producing mines in the world. The present yield is about 900 tons of ore per month (containing 17 per cent. of metallic copper), equal to the returns of the most profitable copper mine in England; but this yield is regarded only as an indication of what the output will be when the vein is thoroughly opened out by extensive operations.

The development of these properties will cause the Rocky Mountain Company to become a gigantic enterprise, and there can be no question the profits therefrom will give enormous—probably unprecedented—dividends to the shareholders.

It should be added that, with a view to render the vast resources of the company available to the utmost extent, the company are their own smelters, and for the reduction of their ores are erecting extensive smelting and reduction works in Canyon City. This is a feature of great economic value, and is considered to be of such importance to the interests of Canyon City that the business men of that city gave the ground for the site, consisting of 10 acres of land (valued at \$10,000), as a present to the company.

Pending the erection of the smelting-works the produce of the mines has been allowed to accumulate. The works, however, will be sufficiently advanced to make a commencement of smelting on Dec. 1 next, and it is quite understood the result of that month's operation will enable the company to pay its first dividend at the annual meeting of the company, to be held on Jan. 22, 1884, a circumstance probably unparalleled in the history of mining. Thenceforth dividends will be regular and continuous, in proportion to the rate of development, and may be safely anticipated to be solid and unquestionable. The nominal capital of the company is \$3,000,000 (£600,000), divided into 300,000 shares of \$10 (2d.) each, fully paid, and non-assessable. The directors are—WILBUR R. JOHNSON, Canyon City (President); J. A. GRIER, Chicago (general freight agent, Michigan Central Railroad); Vice-president: DAVID W. PAGE (of Culver Page, Hoyne, and Co., Chicago); J. W. HARRISON (of Shickle, Harrison, and Howard, St. Louis); Treasurer: W. E. JOHNSON, General Manager, Canyon City; and OSBURN G. STANLEY, Counsellor-at-Law, Secretary. Offices—Canyon City.

The above details give, we believe, all the information of the company referred to, and will convince speculators that the shares represent an exceptionally sound opening to invest in, with a reliable prospect of not only an early advance in price, but a regular and continuous dividend, and consequent gradual fractification of the amount invested to an extent which, to express an opinion of, might be deemed enthusiastic exaggeration. We, therefore, content ourselves by recommending the company's stocks as an investment, in perfect confidence that an unusually profitable result would be realised.

Persons desirous of securing shares are invited to send their applications to us, accompanied with the amount of £2 per share by draft on London Bankers, or BROWN BROTHERS and CO., New York.

A cable is recommended if the number of shares required is considerable.

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VALUABLE MINERAL PROPERTIES, BLAST FURNACES, FORGE, BAR MILLS, and SHEET MILLS TO BE LET ON LEASE.

The property is situate within nine miles from the Port of Newport, the tolls on iron ore amounting to 8d. per ton, and on finished iron 1s. id. per ton. The works are thoroughly well supplied with water, and are in every way complete, and turning out 500 tons of pig-iron per week, and 115 tons of sheets and 140 tons of coke bars per week; and after providing the requisite fuel for the works a large quantity of coal is available for shipment.

The cottage and house accommodation is complete, consisting of 9 agents' houses and 216 good cottages.

Short particulars of the property are set out below.

COLLIERIES.

The GLYN PITS, with all the requisite winding, pumping, and mechanical haulage appliances, and improved screens necessary for an output of 200,000 tons per annum at the least.

The seams of coal worked are the Rock Coal and Meadow Vein, and the Old Coal Seam is opened by this winding.

There is a very large quantity of coal unworked in the above-mentioned and other seams.

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There are appliances at this colliery necessary for raising an output of 50,000 tons per annum.

BLAST FURNACES.—The blast furnaces are 2 in number, of the respective heights of 60 and 48 feet, able to make of 700 tons of pig-iron weekly, supplied with ample blowing, steam, and heating power.

120 coke ovens, foundry, fitting shop, smiths' shops, boiler makers' shop, and locomotive shed.

The colliery is about 1 mile from the furnaces, with a private railway between.

FORGE.—25 puddling and balling furnaces, puddling rough down and tin plate bar rolls, steam hammer, 80 cwt.

MILLS.—4 sheet mills, with ample furnace and shear power for full make of mills.

One engine drives two mills, 2 other mills driven by separate engines, 14 boilers for forges and mills, 10 working with waste heat, corrugating and curving mill.

Also, TWO LARGE STEAM COAL COLLIERIES TO LET in the Monmouthshire and South Wales coal field.

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(Signed) VICTOR T. GRILLET, Treasurer.

RE RICHARD THOMAS MIDDLETON, DECEASED.

PURSUANT TO THE ACT OF PARLIAMENT, 22nd and 23rd Victoria, Cap. 35, intituled "An Act to further amend the law of property and to relieve Trustees." Notice is hereby given, that ALL CREDITORS and OTHER PERSONS having any DEBTS, CLAIMS, and DEMANDS against or upon the Estate of RICHARD THOMAS MIDDLETON, late of No. 9, Albion-grove, Barnsbury, Islington, in the County of Middlesex, and of the *Mining Journal* Office, Fleet-street, in the City of London, Newspaper Proprietor, deceased (who died on the 10th day of September, 1883, and whose Will was proved in the Principal Registry of the Probate Division of Her Majesty's High Court of Justice on the 25th day of October, 1883, by HERBERT CHARLES GRAY and JOHN WILLIAM MOFFATT, the Executors therein named), are hereby required to send the PARTICULARS of their DEBTS, CLAIMS, or DEMANDS, in writing, to us, the undersigned, the Solicitors for the said Executors, on or before the 10th day of December next, after which date the said Executors will proceed to DISTRIBUTE the ASSETS of the said deceased among the parties entitled thereto, having regard only to the debts, claims, and demands, of which they shall then have had notice, and that they will not be answerable or liable for the assets so distributed to any person or persons of whose debts, claims, or demands they shall not then have had notice.

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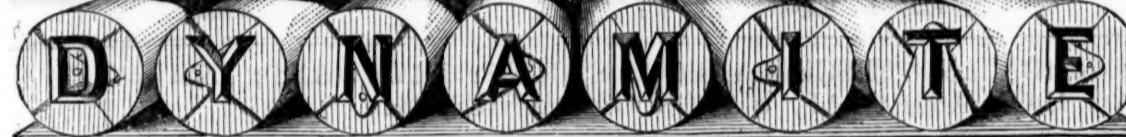
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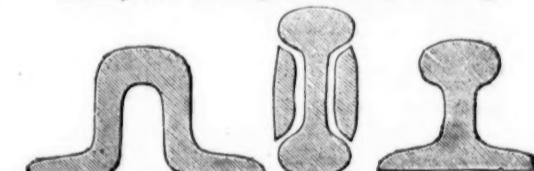
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SAFETY FUSE
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This manufacture embraces all the latest improvements for use in Blasting in Mines, Quarries, or for Submarine Purposes; and is adapted for exploding Gunpowder, Dynamite, or any other Explosive; and is made suitable for exportation to any part of the world.

Price Lists and Sample Cards on application.

All communications to be addressed—

ROSKEAR FUSE WORKS,
CAMBORNE CORNWALL.

CALIFORNIAN AND EUROPEAN AGENCY.
509, MONTGOMERY STREET, SAN FRANCISCO, CAL.
J. JACKSON, Manager

[Nov. 10, 1883.]

THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
3200 Blue Hills t, c, St. Agnes	4 11 8.	34.	34	0 4	0 2	0..May 1881
6000 Carn Brae, t, Illogant	11 7 11.	4	3	3 1/2	52 11	0 10 0..Nov. 1881
4000 Craignant Bach, * t, Cardigan	5 0 0.	—	—	C 5	0 3	5 0..Nov. 1882
10243 Devon Gt. Consols, c, a, Tavistock*	1 0 0 0.	23%	1 1/2	118 7	0 0 8	9..Dec. 1880
4700 Dolcoath, c, t, Camborne	10 14 10.	63	60	135 16	0 1 0	0..Apr. 1883
6400 East Pool, t, Illogan	0 9 40.	37 1/2	40	37 1	6 0 0 13	0..Sept. 1883
12000 Great Holway, * t, Flintshire	5 0 0.	—	—	0 12	6 0 7	6..Sept. 1883
15000 Great Laxey, * Isle of Man†	4 0 0.	12 1/2	10 1/2	29 18	0 5	5..Oct. 1883
8462 Green Hurlth, t, Durham	0 6 8.	7 1/2	7 1/2	4 11	0 0 5	0..Oct. 1883
9830 Gunnislake (Clitters), t, c	2 2 0.	—	—	0 19	0 2	0..Mar. 1882
2800 Isle of Man, t, Isle of Man*	25 0 0.	—	—	83 5	0 1 0	0..Sept. 1880
6000 Kilkisford, t, Chacewater	4 3 8.	15 1/2	15 1/2	0 12	6 0 4	6..July 1883
20000 Leadhills, * t, Lanarkshire	6 0 0.	2 1/2	2 1/2	1 5	0 0 3	0..June 1883
430 Liebourn, * t, Cardiganshire	18 15 0.	—	—	0 15	0 0 10	0..June 1883
10000 Melinase, c, Hawley	3 0 0.	3 1/2	3 1/2	2 3	0 0 0	0..Oct. 1883
9000 Miners Mining Co., t, Wrexham*	5 0 0.	5	3	5	0 0 0	0..Oct. 1883
20000 Mining Co. of Ireland, t, c, t*	7 0 0.	—	—	24 0	0 0 2	6..Jan. 1880
1122 North Hendre, t, Wales	2 10 0.	—	—	3 18	0 0 4	0..Nov. 1882
5146 Ditto	1 5 0.	—	—	0 11	0 2 0	0..Nov. 1882
2000 North Levant, t, St. Just	13 6 5.	13 1/2	13 1/2	4 16	0 0 3	0..Feb. 1881
4750 Penhalls, t, St. Agnes	4 0 0.	5 1/2	5 1/2	3 1/2	0 0 1	0..Jan. 1881
12000 Phoenix United, t, c, Llanrhonore	8 0 0.	3 1/2	3 1/2	11 7	6 0 1	6..Apr. 1883
12000 Roman Gravels, t, Salop*	7 0 0.	6 1/2	6 1/2	9 11	0 0 5	0..May 1883
50300 South Cadron, c, St. Cleer	1 0 0.	1 1/2	1 1/2	—	—	..Jan. 1883
6123 South Conduirrow, t, c, Camborne†	7 5 7.	9	9 1/2	94 10	5 6 0	0 8 0..Aug. 1883
9000 South Darren, t, Cardigan	1 0 0.	7 1/2	7 1/2	1	0 0 4	0..Feb. 1880
6000 Tincifey, t, Pool, Illogant†	12 17 6.	6 1/2	6 1/2	53 3	0 0 5	0..Dec. 1881
15000 Van, t, Llandioedd	4 5 6.	4 1/2	4 1/2	25 13	0 0 2	6..Jan. 1883
15000 West Holway, * t, Flintshire	1 0 0.	—	—	0 1	0 0 1	0..Oct. 1881
6000 West Bassett, t, Illogant†	7 0 0.	4	3 1/2	28 3	8 0 6	8..April 1882
12000 West Crebor, c, Tavistock	2 0 4.	2 1/2	2 1/2	0 18	9 0 2	6..July 1883
1024 Wheal Ereira Consols, t, St. Austell	18 0 0.	—	—	58 0	0 1 0	0..Aug. 1883
6000 Wheal Grenville, t, Camborne	15 0 0.	6 1/2	5 1/2	6 1 12	6 0 5	0..Sept. 1882
4295 Wheal Kitty, t, St. Agnes†	5 12 0.	13 1/2	13 1/2	12 18	6 0 1	6..Jan. 1881
3000 Wheal Pevor, t, Redruth†	11 1 0.	4	3	3 1/2	8 13	0 0 4..Mar. 1881

FOREIGN DIVIDEND MINES.

Shares.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
35500 Alamillo, t, Spain†	2 0 0.	—	—	2 13	2 0 3	0..Sept. 1883
130000 Almada and Trito Consol., s-t	1 0 0.	9 1/2	9 1/2	0 6	2 0 1	0..May 1878
20000 Australian, t, South Australia†	7 7 5.	—	—	1 9	0 2 0	0..Aug. 1883
15000 Birdseye Creek, g, California*	4 0 0.	—	—	1 4	0 0 3	0..Dec. 1882
30000 Bratberg, c, Norway	2 0 0.	—	—	2 7	0 2 0	0..Sept. 1883
130000 California, * g, Colorado	1 0 0.	—	—	0 2	0 0 0	0..Aug. 1883
20000 Copper Mining, * t, South Africa	8 0 0.	49	47 1/2	49 1/2	5 4 1	0..Sept. 1883
65000 Colorado United, * t, Colorado†	5 0 0.	2 1/2	2 1/2	3 14	0 0 1	0..May 1883
65000 Copiapo, c, Chile (42 shares)	3 10 0.	3 1/2	3 1/2	2 11	0 0 1	6..Sept. 1883
70000 English & Australian, * t, c, S. Aust.	2 10 0.	—	—	3 2	0 0 2	0..Mar. 1883
2000 Eng.-Aust., g, Vict., * pref. (20000 o.)	1 0 0.	—	—	0 3	0 0 3	8..Apr. 1883
25000 Fortune, t, Spain†	2 0 0.	—	—	3 1/2	0 0 3	6..Sept. 1883
72000 Frontiers, t, Bolivia, g, New Gran.*	1 0 0.	—	—	0 11	0 0 1	0..Apr. 1883
27000 Henneti, * t, Leadville, Colorado	1 0 0.	—	—	0 0 9	0 0 0	5..Feb. 1883
40000 La Plata, * t, Leadville	2 0 0.	—	—	0 12	0 0 1	0..Oct. 1882
5000 Linares, t, Spain†	3 0 0.	—	—	0 12 11	0 1 3	0..Oct. 1882
20000 Mabel Iron Ore, * t, Spain	10 0 0.	4	3	0 10	0 0 10	0..June 1882
185164 Mason & Barry, * t, Portugal	10 0 0.	—	—	0 10	0 0 10	0..Oct. 1883
64859 Quebrada Ball, Land & Co., Venezuela	10 0 0.	14 1/2	13 1/2	14 1/2	0 0 10	0..Oct. 1883
50000 Panuelillo, c, Chile†	4 0 0.	6 1/2	6 1/2	6 1/2	6 1/2	8 per cent.
25000 Pitangui, g, Brazil (In 6000 £1 pd.)	0 10 0.	—	—	0 18	9 0 3	0..Nov. 1883
1400 Pontalbaud, * t, France	20 0 0.	10	—	8 10	29 11 10	0 14..Dec. 1880
50000 Rara Fortuna, * t, Argent. Republic	1 0 0.	—	—	0 3	0 0 1	0..July 1882
54000 Richmond Consol., t, Nevada†	5 0 0.	5 1/2	4 1/2	44 1/2	5 4 5	0..Aug. 1883
2452 Rio Tinto, c, Mortgage Bds., Huelva, 100	10 0 0.	102	100	102 102	5 per cent.	July 1880
32500 Ditto, shares	10 0 0.	21	20	21	2 18	0 0 18..May 1883
40000 Santa Barbara, * g, Brazil	0 10 0.	—	—	0 12	9 0 1	0..May 1883
120000 Scottish-Australian Mining Co.*	1 0 0.	—	—	0 15	0 0 15	0..May 1883
60000 Ditto, New	2 0 0.	—	—	0 15	0 0 15	0..May 1883
22500 Sierra Buttes, g, California†	2 0 0.	1 1/2	1 1/2	2 6	0 0 1	0..Oct. 1883
40625 Ditto, Plumas Eureka	2 0 0.	1 1/2	1 1/2	3 0	0 0 2	0..Oct. 1883
253000 St. John del Rey (1/25 Stock and multiple dealt in)	70 80.	—	—	5 p.c. for half-year	14..June 1882	
160000 Tambachery, g, Wynaad	1 0 0.	—	—	0 0	0 0 6	0..Aug. 1882
125000 Tharais, * t, sui, Spain (58730 issued)	2 0 0.	6 1/2	6 1/2	6 18	6 0 11	0..May 1883
20000 Tolima, g, s, Colombia (A & Bshares)	5 0 0.	6	5	2 16	6 0 5	0..July 1883
25000 Victoria (London), g, Australia	1 0 0.	—	—	0 13	10 0 0	0..Feb. 1881
100000 Victorine (Nevada, U.S.) Deb. Bds.	1 0 0.	—	—	0 2	0 0 0	6..June 1882
150000 Western Andes, s, Colombia	5 0 0.	5 1/2	5 1/2	4 5	9 0 2	6..Oct. 1883
21000 W. Prussian, (5500 pref. sh. £10 pd.)	10 0 0.	7 1/2	5 1/2	4 2	0 0 8	0..Apr. 1881
64800 Yorke Pen., c, South Aust. Pref.†	1 0 0.	7 1/2	7 1/2	0 3	0 0 3	0..May 1882

* Have made calls since last dividend was paid.

NON-DIVIDEND BRITISH MINES.

Shares.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
25000 Aberdunn, * t, Denbigh	1 10 0.	—	13 1/2	1	1 1/2	..
12000 Anderton, t, c, t, Devonshire	1 0 0.	—	13 1/2	13 1/2	1 1/2	..
12000 Assheton, t, Carnarvonshire	5 0 0.	—	—	—	—	..
12000 Bedford Unit, * t, Tavistock (21 sh.)	0 14 0.	—	13 1/2	13 1/2	1 1/2</	